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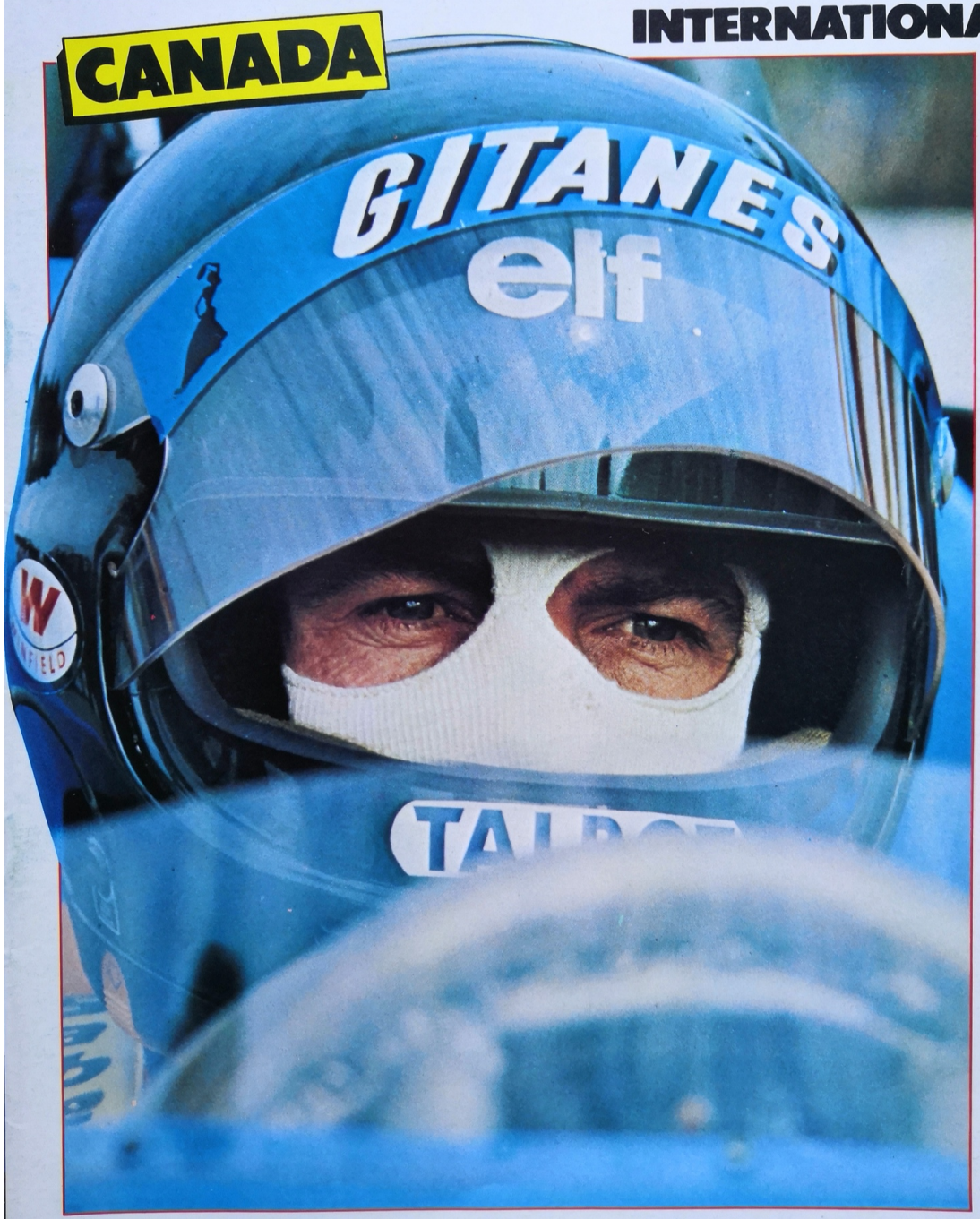

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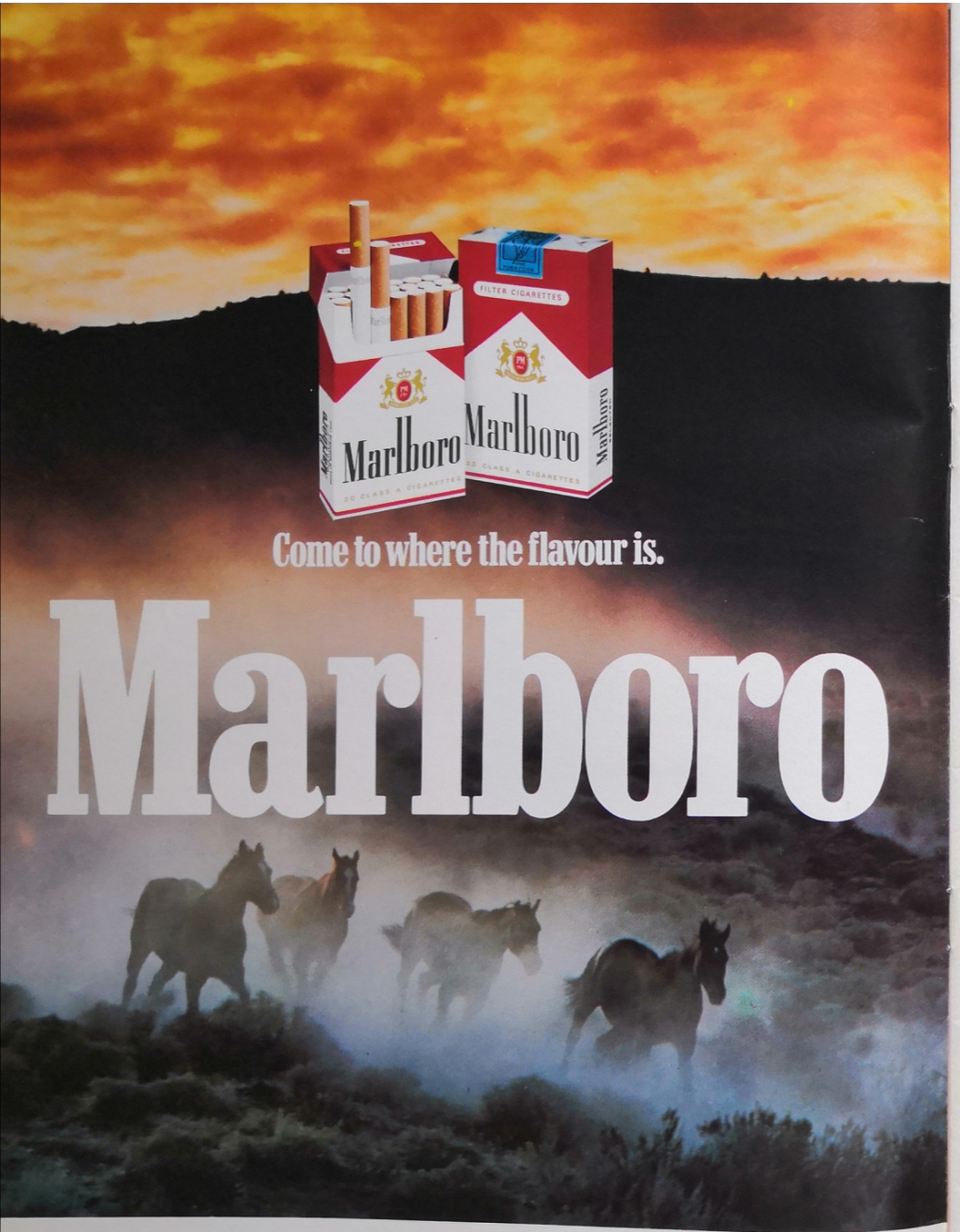

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The Formula One magazine is published 10 days after each Grand Prix.

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The paddock in Montreal

Jacques Villeneuve

Jean-Marie Balestre

VILLENEUVE JNR DISAPPOINTED

Racing at his 'home' circuit this year was not a happy experience for 26 years old Jacques Villeneuve, younger brother of Ferrari team leader Gilles. Despite some stirring attempts to qualify his renta-drive Arrows on Friday and Saturday, the F1 newcomer failed to qualify the car, which he had taken over from Siegfried Stohr.
On Sunday, in the Montreal round of the North American Formula Atlantic championship (in which he's the defending champion), Jacques had gearbox trouble with his March and retired after an off-road moment.
Nevertheless, Canadian television gave the youngster lots of coverage, through it was not quite what he would have appreciated. The cameras picked up an incident on Saturday afternoon during which Jacques was concentrating so hard on his own problems that he almost took his brother off the road. He gets another chance to qualify at Las Vegas.

FISA TO ACT AT LAST ?

Jean-Marie Balestre, president of FISA, looked remarkably confident about being re-elected for a second term of office in the forthcoming FISA elections (October 6) when he sat alongside FOCA boss Bernie Ecclestone at a press conference called for Canadian journalists on the day before qualifying began in Montreal.
In a separate interview with GPI, the much-criticised president said that he expected FISA would have to act soon to change the F1 technical regulations, regardless of the outcome of the elections (which took place after this edition had gone to press). *"It is essential that the cars be given back some suspension movement,"* he said, *"and I hope very much that this will be achieved by unanimous agreement among the engineers from the teams at their meeting in Las Vegas. If not however, FISA will have to look into the possibility of banning the lateral panels,"* a reference to the fixed skirts used by everyone in F1.

Asked about escalating power outputs, Monsieur Balestre said that FISA is *"following the evolution"* of the engine situation in Formula 1. He intimated that it might be necessary to introduce restrictions if power started to exceed the 600 horsepower figure.
It is worth remembering, however, that FISA, as part of last winter's Concord agreement, accepted constructors' demands that no change would be made in the F1 technical regulations before the end of 1984 without the unanimous agreement of all.

LAS VEGAS : IT'S READY

In many countries of the world, go-kart and miniature radio-controlled car races are held on parking lots. But things are bigger and better in the United States, and Caesar's Palace parking lot is to be used to host the final round of the 15 round Grand Prix series. There were a number of people who laughed when they heard that it was to take place in a parking lot, but now the tarmac has been laid, some doubts have been dispelled. From our accompanying photograph, you can see that the track is a lot less twisty and narrow than was at first feared. The final test comes in a couple of week's time, but meanwhile, congratulations to the Las Vegas organisers.

Las Vegas's new circuit

WHO'S THIS ? GIACOMELLA ?

WHY THE DELAY ?

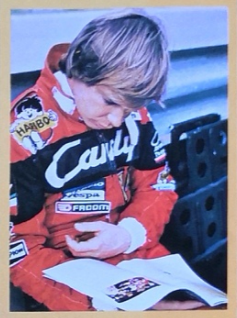
Millions of TV viewers in 25 countries around the world who had waited for the start of the Canadian GP, and a possible decision on who is to be 1981 World Champion, were frustrated to find that the start of the race was delayed by more than an hour and a half.
The immediate cause of the delay was a course car which the organisers, the Canadian Automobile Sports Club (CASC), had placed at the end of the pit lane shortly before the warm-up was due to begin at midday. Wild rumours started to spread along the pit lane to the effect that there was insufficient insurance, even that the teams were being asked to accept insurance liability on their own account.
The true position, according to CASC president John Magill, was that the insurance waiver, normally signed by all the carriers of the special FOCA pass issued to the teams, had not been signed. *"We discovered this morning, Sunday, that a senior Ferrari official had refused top sign the waiver,"* said Mr Magill, *"and without that waiver there would be no insurance for the race. It was impossible for us to continue..."*
CASC insisted that the insurance contract was the same as at past Canadian GPs, and that the same underwriter insures the Long Beach and Las Vegas races. But as Long Beach promoter Chris Pook explained, the circumstances were different in Montreal this year. *"There is a document for all races which drivers and mechanics must sign in order not to hold organisers responsible,"* said Pook. *"The document was changed for this race, and the wording was very broad indeed."*
We understand that the necessary waivers were, in fact, eventually signed by all the teams in Montreal. It will nevertheless be necessary for the matter to be straightened out if there is not to be a repeat performance in Las Vegas on October 17.

REGAZZONI CASE REJECTED

A judge in the US Federal court, at a recent hearing in Los Angeles, has rejected a twenty million dollar suit brought against the Long Beach GP organisers on behalf of Clay Regazzoni. Lawyers for Regazzoni claimed that the Long Beach circuit, where the Swiss driver crashed last year when the brake pedal of his Ensign broke, was not safe. His Ensign hit a concrete wall at the Queen's hairpin, and Regazzoni sustained serious insuries which led to his partial paralysis.

To the relief of the race organisers thoroughout North America, the Federal judge accepted the Long Beach plea that Regazzoni, a previous winner of the Californian GP, had forfeited any rights by signing the 'release and waiver' form required of all competitors in F1 races.

PIRONI LEADS THE DRIVERS

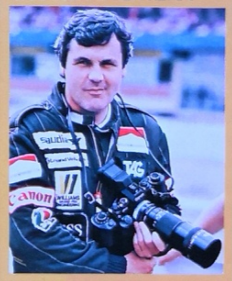


At a meeting of the GPDA on Saturday afternoon, Didier Pironi was unanimously elected vice-President. Sixty-six per cent of the drivers were present, which means 20 of the current GP field. The title of vice-president indicates that Jody Scheckter remains as president of the drivers association, but that Pironi will take over when the former South African world champion steps down.

SILLY SEASON: WAIT UNTIL AFTER LAS VEGAS

Two events in the past couple of weeks have upset the driver transfer market. First of all, Alan Jones announced his retirement, and since then, as we were going to press, Niki Lauda announced that he would be returing to racing. What he didn't say was who he would be driving for. In this edition, Heinz Pruller explains why Niki hasn't made up his mind as to which car he will drive. But Marlboro would very much like him to sign for them, and Williams, Arrows and Brabham mustn't be discounted.
Jones's retirement came as a nasty shock to Frank Williams who found himself without his number one driver, although the position was almost certainly offered to Reutemann immediately. The Argentine told us that he'd accepted on certain conditions, and that the ball was now back in Frank's court. Eddie Cheever is favourite to become number two driver for Williams. But the Romedomiciled American is currently in demand. Arrows and Ragno had expected him to sign for them at Monza and Guy Ligier would like him to replace Tambay in the Talbot Gitanes team. Guy is looking for another driver, either a big name such as Reutemann, Piquet (not easy) or a talented youngster to take over from Laffite in a few years' time.
Alfa Romeo would very much like to sign de Angelis as number one driver beside Bruno Giacomelli, but first of all Lotus would have to free him from his contract. Alfa's second choice is Eddie Cheever...
If de Angelis should stay with Lotus, and Cheever go to Williams, that would allow Jean-Pierre Jarier to join Gerard Ducarouge at Alfa Romeo. Osella would like Jarier to stay with them, but as usual, it's a question of money.
There are still many places free among the teams, which is why many team managers are keeping in contact with Marc Surer (a favourite for Arrows), Derek Daly and Keke Rosberg.
Finally, what of Mario Andretti. The word from Canada was that Essex were willing to put a lot of money into the proposed Ensign-Gurney team, of which we spoke in July, if Andretti is number on driver.

JONES FOCUSES ON RETIREMENT



Where's your press pass Alan ? The world champion may not be racing racing Grand Prix cars next year, but perhaps he's expanding his journalistic activities. At Montreal he was demonstrating one of his sponsor's products, a Canon F1.

A HISTORY OF FORMULE RENAULT

If you want to know how Jacques Laffite, Didier Pironi, Patrick Tambay, Rene Arnoux and Alain Prost cut their teeth in racing, you need look no further than a book entitled 'the History of Formule Renault'. You'll find most of the names of the best in French racing amongst the pages of this history of France's answer to Formula Ford from 1968 to the present day. Christian Courtel is the author, and he's covered the Formula in detail.

THE FRENCH CONNECTION

Match point was played in Montreal, but the result was deuce. If Carlos Reutemann had won, then he would have been world champion. But the Argentine didn't win. He didn't even score a point. So now we have to wait for the final round of the 1981 World Championship in Las Vegas before we know who will be Alan Jones's successor.
There were five championship contenders after the Italian GP. Now that's been whittled down to three : Reutemann, Piquet and Laffite. If my memory serves me correctly, a similar situation hasn't arisen since 1968 when Graham Hill, Jackie Stewart and Denny Hulme all started the final race with the chance of becoming world champion. Since then, there have been two more instances when the series has been decided in the final round. But in both cases, it was a straight fight between two drivers: Fittipaldi and Regazzoni in 1974, and Hunt and Lauda in 1976.
Now Reutemann has 49 points, Piquet 48 and Laffite 43. The first two are virtually equal. The third driver's task is more difficult. To win the championship outright, he must win at Las Vegas and neither of the other two must finish in the first four.
What are their respective chances ? It's hard to say. Each car has been a proven winner at various times during the season. But as Jean-Pierre Jabouille points out, no one has driven at Las Vegas before. It means that Goodyear and Michelin virtually have to gamble on what they consider to be the right tyres for the circuit, and that in itself could make a considerable difference. It could favour Reutemann and Piquet at Laffite's expense... or the reverse. No doubt all three drivers will benefit from their teams'maximum attention throughout the week of the race. And might Reutemann have an advantage ? Could Jones, in his last ever Grand Prix, adjust his race tactics to his teammate's advantage ?
And if you're a gambler, why not put your money on the Frenchman ? Some people believe that there's a pattern to everything : a Frenchman has won the last four Grands Prix. Why shouldn't he win a fifth ? That's a question for the gamblers around the tables at Las Vegas, but Piquet, for one, believes that Laffite is the man to beat. He's going for broke. Jacques has everything to win and nothing to lose. But after those four consecutive wins, the French threat can't be taken too lightly.

Eric Bhat

LAFFITE: FROM THE BOTTOM TO THE TOP

The rain favoured the Ligier/Laffite duo (Photos Bernard Asset/A + P)

Jacques Laffite has a habit of bouncing to the top when no one expects him to. It's as though he wants to remind everyone that he's still around. Apart from his win in Brazil in 1979, every one of his victories has been unexpected for one reason or another. And the 1981 Canadian Grand Prix at Montreal was no exception. From tenth on the grid, he took the chequered flag after 63 laps. And now he's one of the three drivers left in the championship race. That, in itself, is surprising. He had trouble even qualifying at Argentina earlier this year !

by Eric BHAT

Bloody lousy car", yelled Guy Ligier at the blue overalled figure on the podium, *"bloody lousy driver"*. The Talbot Gitanes team patron had a broad grin on his face as he stood at the foot of the Montreal rostrum, surrounded by photographers and journalists. Above him, his little number one driver, a bright garland around his neck, almost danced with excitement as he waited for Watson and Villeneuve to join him. Then he yelled down his reply to Ligier *"for a bloke who can't drive in the rain, I didn't do badly, eh ?"*.

It's a well known fact that Laffite doesn't like the rain, although no more than any other driver. The first words he uttered as he got out of his car after the race demonstrated his feelings. *"That was hard work, wow, was that tough ? The rain, overtaking, the concentration ! What's more, I kept getting spray in my face. That was hard."* Only then did he show the delight of having won.

For both Ligier and his driver, it was satisfying as much as it was a kind of revenge. The team's critics hadn't been silenced by their win in Austria, and they were still being accused of being uncompetitive.

That *"bloody lousy car"* has had its problems, and for most of the season, the team has been working hard to make it competitive. Clearly, in Canada, Guy Ligier could allow himself a slight sigh of relief. But only six months earlier, he was

a very worried man. At Buenos Aires, Laffite was only 21st on the grid. A depressed Guy Ligier, dragging his suitcase behind him, cut a forlorn figure as he walked through the Argentine paddock on the Friday evening. He couldn't even bear to see any more. He was going home. Who would have guessed, six months later, that he would be grinning so broadly as Laffite notched up another nine points, and headed for the final round with a chance of winning the title ?

In Argentina, Laffite was remarkably calm, considering his reputation for throwing tantrums when things went wrong. *"I'm now in my seventh Grand Prix season"*, he said. *"I know too much to worry about it. I've seen uncompetitive cars become front runners, and quick cars suddenly go slower. We'll be back on top soon, we're working in the right direction"*. He was right of course. The JS 17 worked its way up the grids, and has now won two races.

It's been revenge for the car, but also for the driver. Jacques, too, had his critics. *"He's useless in the rain,"* people commented. *"Come to that,is he any good in the dry ? Why can't he challenge the really top drivers ? Is he afraid of being shown up ?"* Those were the questions, now, perhaps, they've been answered.

Within the Talbot Gitanes team itself, no one had any doubts. *"Few people appreciate it, but our little fellow's quick,"* confirmed Jean-Claude Guenard, a former driver himself and one of the team's engineers. *"He wasn't overshadowed by either Depailler or Pironi. Few people know just how quick he is."*

So Ligier's *"bloody lousy car"* and *"bloody lousy driver"* worked well together in Montreal. One might be tempted to add, with the same irony, that they worked well with *"bloody lousy tyres."* Some people described them as such during practice for the Canadian GP. Goodyear's domination on pure performance was considerable, leading people to talk about the *"usual uncompetitive Michelins here at Ile Notre Dame."* But the Michelin men from Clermont-Ferrand had worked hard. They brought eight different types of tyre with them to Canada.

Pierre Dupasquier, normally sensitive to Michelin's critics, treated such criticism with indifference. *"We're not that bad. Watson set the fastest time on Saturday morning, and Prost was on race tyres on Saturday afternoon. He set a very good time on them. I don't think we're going to be badly off in the race."* The Michelins turned the tables when the rain came down on Sunday. But that was only apparent after a few laps.

Laffite started the race from tenth on the grid. The fault of a *"bloody lousy car"* ? No, more because of bad luck in the official qualifying sessions.

On Friday morning, Jacques complained of the car being too hard, difficult to drive. *"I thought that there was some mechanical problem,"* explained Jean-Pierre Jabouille. *"But after we did a back to back test with the spare, it appeared that there was no major problem. It was simply that the track was very bumpy. Everyone was in the same kind of trouble. Jacques just had to get used to it."*

In fact, the JS17 was performing well, and Jacques proved the fact by setting the best time on Michelins that afternoon, behind five Goodyear-tyred cars. *"Even so"*, said Jacques, *"I made a mistake on my best lap. I ran wide at the hairpin."* Jacques was honest, especially when most people complained of traffic.

On Saturday, he dropped down to tenth on the grid, but neither he nor his Ligier were to blame. Each time he put on a set of qualifiers, something went wrong. On the first set, he tangled with Alboreto's Tyrrell, then an engine blew, leaving oil on the circuit. But there was still a second set. The mechanics fitted them, and Jacques set off again. He was just getting them up to a working temperature when Villeneuve crashed, causing practice to be stopped. Result : tenth on the grid.

When the rain began to fall on Sunday afternoon, shortly before the race, the 24 qualifiers were given a ten minute practice session to acclimatise themselves to the soaking track. That's when Jabouille put on his thinking cap and came up with rain tyres that didn't have too much tread, in case the track began to dry. *"A good compromise, lucky perhaps, but it turned out to be right."* Jabouille wasn't saying which tyres he chose, but they had shown promise in previous races. At first, Laffite's car was fitted with a hard compound version, but after two spins during the mini warm-up, he opted for a softer compound. What happened next is easily summed up : he made what he described as a *"super start"*, benefited from the Goodyear runners' lack of competitivity, overtook Prost, and disappeared towards the chequered flag.

There was a touching reunion for Laffite and Jabouille after the race. The brothers-in-law know one another too well to have to say a great deal. The smile that passed between them meant everything. *"You're going to have to delay your operation again"*, Jacques said quietly. Jean-Pierre was meant to have his leg fixed on October 5. But now he's postponed his date with the surgeon's knife, and reserved his air ticket for Las Vegas. *"Yes, it would be good if we won in America"*, replied Jabouille. *"I swear you could have won at Monza. That puncture might have cost us the championship"*. But Jacques was too elated to think of such draw-backs : *"it's not serious, the important thing is to win races."* He'll be trying to do just that at Las Vegas.

□

Laffite was only tenth on the grid after the dry practice sessions, but in the wet, he was unbeatable

LAUDA'S RETURN: A LITTLE BIT CLOSER

Lauda's chosen life was his own airline, Lauda Air. Is he bored with it? Is it losing money? Whatever, he wants to swop the cockpit of his Fokker for that of an F1 car (Photo Bernard Asset/A + P)

"I may come back, if...": that was the headline in Grand Prix International No 31 (San Marino) announcing the possible return to Grand Prix racing of Niki Lauda. Lauda's comeback is still a possibility, but now the great Austrian champion has taken some positive steps towards his return to the grid. And the newspapers in France announced the week before the Canadian Grand Prix that "Lauda has already signed for McLaren." The Italian press, one jump ahead as usual, said that Lauda's second (or third?) Grand Prix career would commence at Las Vegas on October 17. That's not true, but the Lauda comeback in 1982 is almost certainly fact. It must be the logical step after Lauda's 48 testing laps at Donington, three days after the Italian Grand Prix.

by Heinz PRULLER

To be absolutely honest, I haven't yet decided completely whether to return to racing. There are still a few little things that I have to clear up inside me. Which car am I going to drive in 1982? That's one thing I have to decide. I don't really like the super hard-sprung cars currently without suspension. So I'm going through all the teams and thinking about the cars they have to offer," Niki told me over the Montreal weekend.

If he does come back, he may well be the most highly-paid driver in racing history. The rumour goes that he could earn three million dollars if he joins Marlboro McLaren, but he could earn 3.2 million if he joins another team. When he checked into a London hotel prior to the Donington test, Frank Williams was one of the first to speak to him on the phone. Ar-

September 16, Donington: Niki Lauda is back in a Grand Prix car's cockpit. The last time he was in a similar situation was during first practice at Montreal, September 28, 1979 (Photo David Winter)

rows boss Jackie Oliver secretly admits, *"I've had an offer from a German sponsor willing to pay ten million Deutschmarks (£ 2,500,00) on the spot if we can get Niki to drive for us in 1982."*

The Lauda return is a a mega-buck story. But Marc Surer isn't so sure: *"it's such a shame. Everybody thinks that he's only coming back to earn money. Why doesn't anyone point out that he just wants to race again."* Bruno Giacomelli's answer to Mike Doodson's question about money was typically astute and funny: *"I know that antiques are highly valued these days, but Niki isn't that old yet."*

Lauda himself clarifies the money rumours. *"There is absolutely no motivation for me to go back to racing because of tax debts or because my company is going down. That's not true. Lauda Air will go on existing in its current form, but it cannot expand because of the present economic situation. That means we carry on with two Fokkers, two Mysteres but no DC10, and that gives me more time. My job would have been to expand the company. But with the economical situation as it is, I have to freeze the future and wait until it's on the up again. Meanwhile, I could use the time to go back to my sport and hobby - driving racing cars."*

So once again Niki Lauda was the man in the news at the Canadian Grand Prix. Two years ago, everyone was talking of his retirement. This time it was his comeback that kept the rumour-mongers occupied. And they had been busy over the past few months as Lauda's return developed. It had been the same two years previously. This time, Lauda has become more and more enthusiastic about Grand Prix racing, whether he's been at the circuit or watching on television at home. Niki had realised that sooner or later, he wanted to get into a racing car again and find out what it was like. He wanted to do it quietly, without any pressure or fuss from the media. Perhaps one of the most astonishing things about the test was that neither Marlboro nor McLaren talked Niki into going to Donington. It was Niki's own idea, suggested the Sunday before at Monza. *"I would like to try your car. How about next Wednesday?"* the Austrian had asked. It was a choice he played down when questioned by journalists later. *"There are Sunday drivers who drive only on Sundays for the fun of it, and there are Wednesday drivers who drive racing cars on Wednesday just for pleasure..."*

But the great day was prepared secretly and professionally. Earlier in the year, BMW racing managr Dieter Stappert had tried to get Niki to drive for his team at Le Mans. The Austrian had turned him down: *"even if I would have liked to do it, I couldn't because Sante Ghedini has all my racing equipment at his home in Rome."* True enough, Parmalat racing manager Ghedini had built a 'Niki Lauda shrine' in his home. The familiar red overalls hung on the wall, the gloves were spread out on either side, and the shoes and socks stood on the floor.

At Montreal in 1979, Ghedini stood in a hotel lobby clutching those same overalls with tears in his eyes: *"now I shall retire too. What else is left for me in racing?"* he had wailed. Two years later, Ghedini dismantled his shrine, packed up Niki's gear and met Niki and Marlene at an airport before they took off for Donington. But Marlene didn't go to Donington. Earlier in the summer, Niki's wife told me privately: *"I can't imagine Niki going back to racing. I just can't see it. It wouldn't be Niki. Doing something crazy like flying to the moon - okay, that's something new, but not racing. He's been through that already. It would be a step backwards. But if he really does it, I just hope that he is driving again purely because he likes it and not for the money - to buy another aeroplane or something like that."*

Marlene didn't witness her husband's return to a Formula 1 cockpit, but John Watson was there. Lauda and Watson were former teammates in the Brabham-Alfa team in 1978 when they took Brabham's last one-two at Monza. Wattie had just returned from Monza where he had survived the biggest Grand Prix accident of the year. McLaren's Ron Dennis asked Wattie to come to Donington to give Niki some guidance.

Lauda chats with Ron Dennis, his ex-and future (?) team manager. As ever, Lauda bombarded Dennis with his usual pointed questions. He wanted to drive a modern Formula 1 car; Dennis provided it (Photos David Winter).

It was 9.30 in the morning. When Watson arrived, Lauda had already done a few slow, careful laps in MP4/02, the spare car at Monza. First time at Donington, first time in a McLaren, first time on Michelins: small wonder that Niki asked John to drive him around in his Jaguar XJS to show him the line, gearchange and braking points. Then Niki got back into the McLaren for a few more laps. When he stopped again, he said to John, *"I don't really know whether the car is good or not. Why don't you do a few laps?"* The Ulsterman obliged. With Monza settings, very little wing and then a few adjustments, Watson did a 59.7s, his best ever at the circuit. *"I thought 'that's good enough' and the handling is safe for Niki to drive."*

Lauda took the wheel again: steady laps, no spins, no dramas. *"I enjoyed being in a racing car more and more,"* Niki confessed later. *"The pleasure wasn't there the first corner, first lap, but it came back consistently."* Slowly Lauda became part of the machinery, enjoying accurate gear changes, all the right movements and reactions of a racing driver. *"It was a very nice feeling to be a racing driver again, to realise that I could still go quickly, enjoy the speed and control of 520 horsepower. But most of all I wanted to find out how these racing cars are to drive nowadays."* Niki drove with increasing speed and excitement. He made a few stops for adjustments, for instance, to make the car turn in more gently. *"But of course, with these hard-sprung cars, the whole driving style has changed."* Watson pointed out that *"of course Niki is intelligent enough to know how to drive the car."* Niki didn't find it difficult, but physically tough. *"I'm not surprised he got a bit cramped,"* said Watson, *"his racing muscles have been out of action for two years."*

And what did the stopwatches say? On the same tyres as Watson, Lauda did a 62.0s. When he changed from the Monza back-up tyre, 001, to the softer 707, he improved to 60.6s. That's according to McLaren, but there are some eye-witnesses who swear that Lauda was only a tenth or two slower than Watson. Ron Dennis explained: *"you can't really compare the times they did that day. They used different tyres, there were different conditions; the times are really unimportant."*

"At the end of the session I really wanted to give it a go," Niki explained smiling broadly. *"It was like, let's say, Monaco when I went out to get pole position at any price."* And when he stopped, he was tired but very happy. He suddenly realised what his life had lacked during the last two years. Racing was still in his blood.

Jackie Stewart put it a different way: *"once a Niki Lauda, you are always a Niki Lauda. I'm not in the least surprised he was so quick."* Jackie was in a similar situation six years ago when he tried the Tyrrell six-wheeler because he wanted to find out whether he still wanted to be a racing driver. The result? *"No emotions, no feelings, no desire to go back."* With Niki, though, it was the opposite. He rediscovered the excitement, pleasure and emotion of racing. *"I guess Niki is confused,"* Stewart smiled, *"now that he has found out that he still enjoys driving - though I am not sure whether he has already made up his mind."* *"Very brave"* was how Emerson Fittipaldi and Nigel Mansell explained the comeback, but Emerson questions possible family pressure. And remember what they said about Emerson: one child makes you a second a lap slower... *"Niki might not be the fastest,"* Gilles Villeneuve, his successor at Ferrari explained, *"maybe half a second slower than Alan Jones. I doubt whether he'll be the Super-Lauda of 1975 and 1976 again. He'll be more the Lauda of '78 or '79 when he'd already started losing his love for the sport. But this Lauda would still be good enough to win races again, maybe even the World Championship."*

Back home in Austria, Niki Lauda might well have chuckled to himself as he read the comments about his possible comeback. We spoke by telephone twice a day during the Canadian GP, after each practice session. Lauda wrote down all the lap times, tyre numbers and incidents, just as he had from 1974 to 1976 when he was driving with Ferrari. In those days, Lauda would take the list of times back to the peace and quiet of his hotel room and examine and analyse them thoroughly. Obviously his second or third racing career will be tackled with as much care and professionalism as possible. Later there will be long sessions in the gym, and later still, probably in November, long testing sessions.

"There's no hurry," says Lauda, *"I found out what I wanted to find out at Donington. I won't necessarily start trying all the other cars so that all the team managers can put on their show. My work, my part of the business is done. Now I let the others finish the championship and return to Europe. Then we will decide everything."* The teams will have to have entered their cars and drivers with FISA by November 15. *"That will be the teams' problems, not mine."* Both Lauda and McLaren would very much like the South African GP to be cancelled to give them more time to prepare for 1982. *"That would give me almost half a year. You can see, I'm in no hurry at all,"* admits Lauda.

Lauda might even be a turbocar driver in 1982. McLaren has ordered a Porsche turbo engine, but there are a number of options available to the team. Brabham have exclusive use of the BMW turbo engine, but only until July 1. By then, we shall know whether Jackie Stewart was right when he predicted *"Niki will enjoy the first three months of his comeback, but the remaining nine months could be painful."* On the other hand, Niki Lauda, the man with the difficult decision, could stun the racing world again. But not only the racing world: the sport has been crying out for a public superstar for some time now. Maybe that superstar will return to racing. □

THE FILM OF THE RACE

Goodyear may have dominated practice, but it was the Michelin-tyred cars that took most of the top six positions. While both Williams, and - to a lesser extent - Piquet's Brabham dropped down the field, Prost and Laffite emerged as front runners in front of Villeneuve and Watson. Of these four, Laffite was the happiest at the end of the race, and Prost the unhappiest. The race was enlivened by incidents, but also talented drives by Pironi, Daly and Giacomelli.

1 - Reutemann was too quick at the start, but teammate Jones shoots through from the second row on the soaking track to lead the field

2 - Jones leads on the first lap in front of Piquet on the right and Prost avoiding his spray on the extreme left

3 - Prost takes the lead on the seventh lap in front of Laffite who overtake six laps later

4 - Pironi's performance almost surpassed Villeneuve's. In 24 laps, Didier moved up from 21st to fourth place, but on the 25th, his electrics failed

5 - Once Laffite took the lead, he quickly pulled away. He led Villeneuve by 18 seconds. But stuck behind Andretti, Laffite loses eight seconds in four laps

6 - Villeneuve and Watson battled superbly for second place, the winner being the McLaren driver who moves ahead on the 38th lap

7 - Villeneuve quickly lost contact with Watson, having twice knocked his front wing, the first time against de Angelis's Lotus, the second, here, against Daly's well-driven March

PRACTICE

Five Goodyear-equipped drivers in the first five places: that was the position at the end of the first timed session. Clearly, the Brabhams were on form: Piquet was quickest, half a second in front of Reutemann, and Rebaque was fifth fastest. The two Williams were provisionally second and third. De Angelis came next, his Lotus 87 clearly suited to the tight Ile Notre Dame circuit. Laffite, sixth fastest, was the quickest of the Michelin men in front of Watson. Things weren't going well in the Renault team. Prost had had two turbos break, but in between time, he had set eighth fastest time. Arnoux was even worse off: his engine broke leaving him with 19th fastest time.

Piquet may not have improved his time the next day, but he would still start the race from pole position as Reutemann hadn't gone fast enough to bump his fellow South American and championship rival off pole position. Prost kept himself in the hunt with a tremendous third fastest time, despite the uncompetitive Michelin qualifiers. Arnoux almost did as well as his teammate on one set of qualifiers, setting a time 0.3s slower than Prost. The Lotus drivers made the best of their cars and Goodyear tyres, Mansell starting from fifth on the grid, and de Angelis being seventh. Laffite, the future winner, was only tenth on the grid have used his qualifiers at the worst moment possible.

It wasn't a good day for Jacques and Gilles Villeneuve. The Ferrari driver crashed, and Arrows's new recruit failed to qualify for his first Grand Prix.

RACE

The start was delayed by the insurance problem, but then came the rain, shortly before the race was finally due to begin. The organisers allowed the drivers another warm-up to get used to the soaking track.

For a man on the verge of retirement, Jones proved that he has lost none of his verve. No one else was going to lead him into the first corner. He led at the end of the first lap in front of Piquet, Prost and Reutemann. The Argentine had jumped the start and was penalised a minute for his eagerness. Arnoux was the first retirement. He found himself sandwiched between the Ferraris of Pironi and Villeneuve and spun into retirement. Pironi dropped to 21st position in the same incident.

Jones led Piquet until the sixth lap. But on the seventh lap, the Goodyear runners took a dive. Prost moved into the lead, followed by Laffite. Jones had spun and Piquet had dropped to third. Reutemann, at that time, had dropped to 17th, in a car that he found to be undriveable. Pironi, on the other hand, had climbed back up to 11th.

A lap later, the eighth, Villeneuve and Watson demoted Piquet even further. Laffite continued to worry Prost for the lead, and the Renault driver, suffering from brake trouble, was unable to prevent the Talbot man from moving ahead on the 13th lap. He quickly pulled away, while Villeneuve and Watson soon caught the Renault. Piquet was fifth in front of Pironi who had occupied sixth from the tenth lap, after a storming drive in the rain. Another hero in the wet was Daly who had taken his March into seventh place by the 16th lap.

Laffite quickly pulled out a 15 second lead ahead Villeneuve and Watson, both of whom had overtaken Prost. He had briefly lost fourth place to Pironi who overtook him on the 22nd lap, but retired three laps later which an electrical problem. Piquet still held fifth place, but Giacomelli had moved up to sixth.

Behind Laffite, the battle continued for second place. Watson began to challenge Villeneuve on the 30th lap, and eight laps later, the McLaren driver got by the Canadian. Villeneuve couldn't stop Watson from pulling away as he'd damaged his front wing in two separate incidents, and ultimately it came off altogether. So the first three places were settled. Behind them, Prost lost fourth place on the 49th lap when Mansell knocked him off at the hairpin. Giacomelli had overtaken Piquet 13 laps earlier and inherited fourth place, in front of the Brabham and de Angelis's Lotus. Because of the rain, the race ran into the two hour limit and was stopped after 63 laps instead of the programmed 70.

Montréal statistics

CANADIAN GRAND PRIX

Date : September 27, 1981
Circuit length : 2.74 miles
Race distance : 70 laps shortened to 63, 172.64 miles
Conditions : frequent showers
Attendance : 48,000 spectators

THE RECORD

(last five races)

1976 : HUNT (Mc Laren Ford)
1977 : SCHECKTER (Wolf Ford)
1978 : VILLENEUVE (Ferrari)
1979 : JONES (Williams Ford)
1980 : JONES (Williams Ford)

STARTING GRID

REUTEMANN
Williams FW07
1'29"35

PROST
Renault RE30
1'29"90

REBAQUE
Brabham BT49
1'30"18

ARNOUX
Renault RE30
1'30"232

LAFFITE
Talbot Ligier JS17
1'30"70

PIRONI
Ferrari 126C
1'31"35

CHEEVER
Tyrrell 011
1'31"54

ANDRETTI
Alfa Romeo 179
1'31"74

PATRESE
Arrows A3
1'31"96

DALY
March 811
1'32"30

ALBORETO
Tyrrell 011
1'32"70

SALAZAR
Ensign N180B
1'33"84

PIQUET
Brabham BT49
1'29"21

JONES
Williams FW07
1'29"72

MANSELL
Lotus 87
1'29"99

DE ANGELIS
Lotus 87
1'30"231

WATSON
Marlboro MP4
1'30"56

VILLENEUVE
Ferrari 126C
1'31"11

DE CESARIS
Marlboro MP4
1'31"50

GIACOMELLI
Alfa Romeo 179
1'31"60

TAMBAY
Talbot Ligier JS17
1'31"74

SURER
Theodore TY01
1'32"25

BORGUDD
ATS HGS1
1'32"65

JARIER
Osella FA 1/C
1'33"43

Non-qualified :

ROSBERG (Fittipaldi F8C) 1'34"31
SERRA (Fittipaldi F8C) 1'36"54
HENTON (Toleman TG181) 1'36"64
VILLENEUVE J. (Arrows A3) 1'36"72
WARWICK (Toleman TG181) 1'36"99
GABBIANI (Osella FA1/B) 1'37"49

TIMES IN UNOFFICIAL PRACTICE

FRIDAY MORNING		SATURDAY MORNING	
Piquet	1'30"248	**Watson**	1'30"024
Jones	1'30"714	**Mansell**	1'30"111
Reutemann	1'31"156	**Reutemann**	1'30"475
De Angelis	1'31"171	**Piquet**	1'30"849
Watson	1'31"412	**De Angelis**	1'30"953
Pironi	1'31"630	**Prost**	1'31"257
Rebaque	1'31"794	**Rebaque**	1'31"440
Prost	1'31"987	**Giacomelli**	1'31"550
Andretti	1'32"600	**De Cesaris**	1'31"566
Tambay	1'32"835	**Laffite**	1'31"661
De Cesaris	1'33"460	**Arnoux**	1'31"805
Mansell	1'33"603	**Daly**	1'31"961
Patrese	1'33"759	**Jones**	1'31"965
Cheever	1'33"798	**Borgudd**	1'32"072
Villeneuve	1'33"878	**Alboreto**	1'32"088
Laffite	1'33"977	**Andretti**	1'32"396
Giacomelli	1'34"088	**Patrese**	1'32"588
Rosberg	1'34"103	**Cheever**	1'32"745
Alboreto	1'34"652	**Villeneuve**	1'32"782
Jarier	1'35"668	**Pironi**	1'32"889
Surer	1'35"808	**Surer**	1'33"043
Borgudd	1'35"817	**Tambay**	1'34"027
Arnoux	1'35"832	**Rosberg**	1'36"053
Warwick	1'36"758	**Serra**	1'36"843
Daly	1'36"947	**Villeneuve**	1'37"202
Serra	1'37"806	**Henton**	1'37"292
Salazar	1'37"969	**Gabbiani**	1'37"527
Gabbiani	1'38"555	**Jarier**	1'38"073
Villeneuve	1'38"595	**Warwick**	1'39"794
Henton	1'39"672	**Salazar**	1'56"268

1st WARM-UP

Pironi 2'04"066 - **Tambay** 2'04"367 - **Borgudd** 2'06"456 - **Villeneuve** 2'07"502 - **Laffite** 2'08"012 - **De Angelis** 2'09"238 - **Surer** 2'09"302 - **Prost** 2'09"934 - **Arnoux** 2'10"233 - **Andretti** 2'10"421 - **De Cesaris** 2'10"679 - **Daly** 2'10"993 - **Piquet** 2'11"016 - **Giacomelli** 2'14"209 - **Jarier** 2'16"222 - **Mansell** 2'16"449 - **Rebaque** 2'16"920 - **Salazar** 2'17"712 - **Alboreto** 2'19"984 - **Reutemann** 2'29"796 - **Cheever** 2'34"297 - **Jones** 2'34"368 - **Patrese** 2'36"792

2nd WARM-UP

Watson 1'35"795 - **Piquet** 1'35"843 - **Cheever** 1'37"012 - **Rebaque** 1'37"018 - **Villeneuve** 1'37"667 - **Prost** 1'37"816 - **Pironi** 1'38"085 - **Borgudd** 1'38"308 - **De Angelis** 1'38"614 - **Tambay** 1'39"398 - **Daly** 1'39"635 - **Jones** 1'39"659 - **Laffite** 1'41"293 - **Reutemann** 1'42"115 - **Mansell** 1'42"254 - **Arnoux** 1'42"305 - **Giacomelli** 1'42"539 - **Salazar** 1'43"304 - **Surer** 1'43"481 - **Alboreto** 1'44"507 - **Andretti** 1'45"643 - **Patrese** 1'46"181 - **Jarier** 1'48"458 - **De Cesaris** 2'01"906

WORLD CHAMPIONSHIP

Position/Driver	Long Beach	Brazil	Argentina	San Marino	Belgium	Monaco	Spain	France	Britain	Germany	Austria	Holland	Italy	Canada	TOTAL
1. Reutemann	6	9	6	4	9	—	3	—	6	—	2	—	4	—	49
2. Piquet	4	—	9	9	—	—	—	4	—	9	4	6	1	2	48
3. Laffite	—	1	—	—	6	4	6	—	4	4	9	—	—	9	43
4. Jones	9	6	3	—	—	6	—	—	—	—	3	4	6	—	37
Prost	—	—	4	—	—	—	—	9	—	6	—	9	9	—	37
6. Watson	—	—	—	—	—	—	4	6	9	1	1	—	—	6	27
7. Villeneuve	—	—	—	—	3	9	9	—	—	—	—	—	—	4	25
8. De Angelis	—	2	1	—	2	—	2	1	—	—	—	2	3	1	14
9. Arnoux	—	—	2	—	—	—	—	3	—	—	6	—	—	—	11
Rebaque	—	—	—	3	—	—	—	—	2	3	—	3	—	—	11
11. Patrese	—	4	—	6	—	—	—	—	—	—	—	—	—	—	10
Cheever	2	—	—	—	1	2	—	—	3	2	—	—	—	—	10
13. Pironi	—	—	—	2	—	3	—	2	—	—	—	—	2	—	9
14. Mansell	—	—	—	—	4	—	1	—	—	—	—	—	—	—	5
15. Surer	—	3	—	—	—	1	—	—	—	—	—	—	—	—	4
16. Andretti	3	—	—	—	—	—	—	—	—	—	—	—	—	—	3
Giacomelli	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3
18. De Cesaris	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1
Tambay	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Borgudd	—	—	—	—	—	—	—	1	—	—	—	—	—	—	1
Salazar	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1

RESULTS

1. LAFFITE	Talbot Ligier JS17	63 laps, 172.64 miles in 2h1'25"20, 85.252 mph
2. WATSON	Marlboro MP4	6"23 behind
3. VILLENEUVE	Ferrari 126C	1'50"27 behind
4. GIACOMELLI	Alfa Romeo 179	one lap behind
5. PIQUET	Brabham BT49	one lap behind
6. DE ANGELIS	Lotus 87	one lap behind
7. ANDRETTI	Alfa Romeo 179	one lap behind
8. DALY	March 811	two laps behind
9. SURER	Theodore TY01	two laps behind
10. REUTEMANN	Williams FW07	three laps behind
11. ALBORETO	Tyrrell 011	four laps behind

Fastest lap : WATSON, 1'49"47, 90.117 mph.

THEIR FASTEST RACE LAPS

	Time	Lap n°
Piquet	**1'29"211**	1'29"537
Reutemann	1'29"601	**1'29"359**
Jones	**1'29"728**	1'29"781
Prost	1'31"629	**1'29"908**
Mansell	1'32"233	**1'29"997**
Rebaque	1'31"545	**1'30"182**
De Angelis	1'31"212	**1'30"231**
Arnoux	1'34"151	**1'30"232**
Watson	1'31"617	**1'30"566**
Laffite	1'31"593	**1'30"705**
Villeneuve	1'32"077	**1'31"115**
Pironi	1'31"976	**1'31"350**
De Cesaris	1'32"281	**1'31"507**
Cheever	1'32"652	**1'31"547**
Giacomelli	1'34"995	**1'31"600**
Andretti	1'32"648	**1'31"740**
Tambay	**1'31"747**	1'31"817
Patrese	**1'31"969**	1'32"277
Surer	1'34"424	**1'32"253**
Daly	1'35"552	**1'32"305**
Borgudd	1'34"002	**1'32"652**
Alboreto	1'34"245	**1'32"709**
Jarier	**1'33"432**	1'33"643
Salazar	1'36"016	**1'33"848**

OFFICIAL PRACTICE TIMES

	1st session	2nd session
Laffite	1'49"765	**46**
Watson	1'49"475	**43**
Villeneuve	1'52"087	**47**
Giacomelli	1'51"490	**55**
Piquet	1'51"849	**45**
De Angelis	1'51"927	**47**
Andretti	1'52"580	**61**
Daly	1'54"946	**41**
Surer	1'51"020	**40**
Reutemann	1'50"309	**39**
Alboreto	1'55"977	**52**
Cheever	1'53"994	**42**
De Cesaris	1'50"762	**46**
Prost	1'51"197	**48**

CONSTRUCTORS' CUP

1. Williams 86 pts - **2.** Brabham 59 pts - **3.** Renault 48 pts - **4.** Talbot 43 pts - **5.** Ferrari 34 pts - **6.** McLaren 28 pts - **7.** Lotus 19 pts - **8.** Arrows and Tyrrell 10 pts - **10.** Alfa Romeo 6 pts - **11.** Ensign 5 pts - **12.** Theodore and ATS 1 pt.

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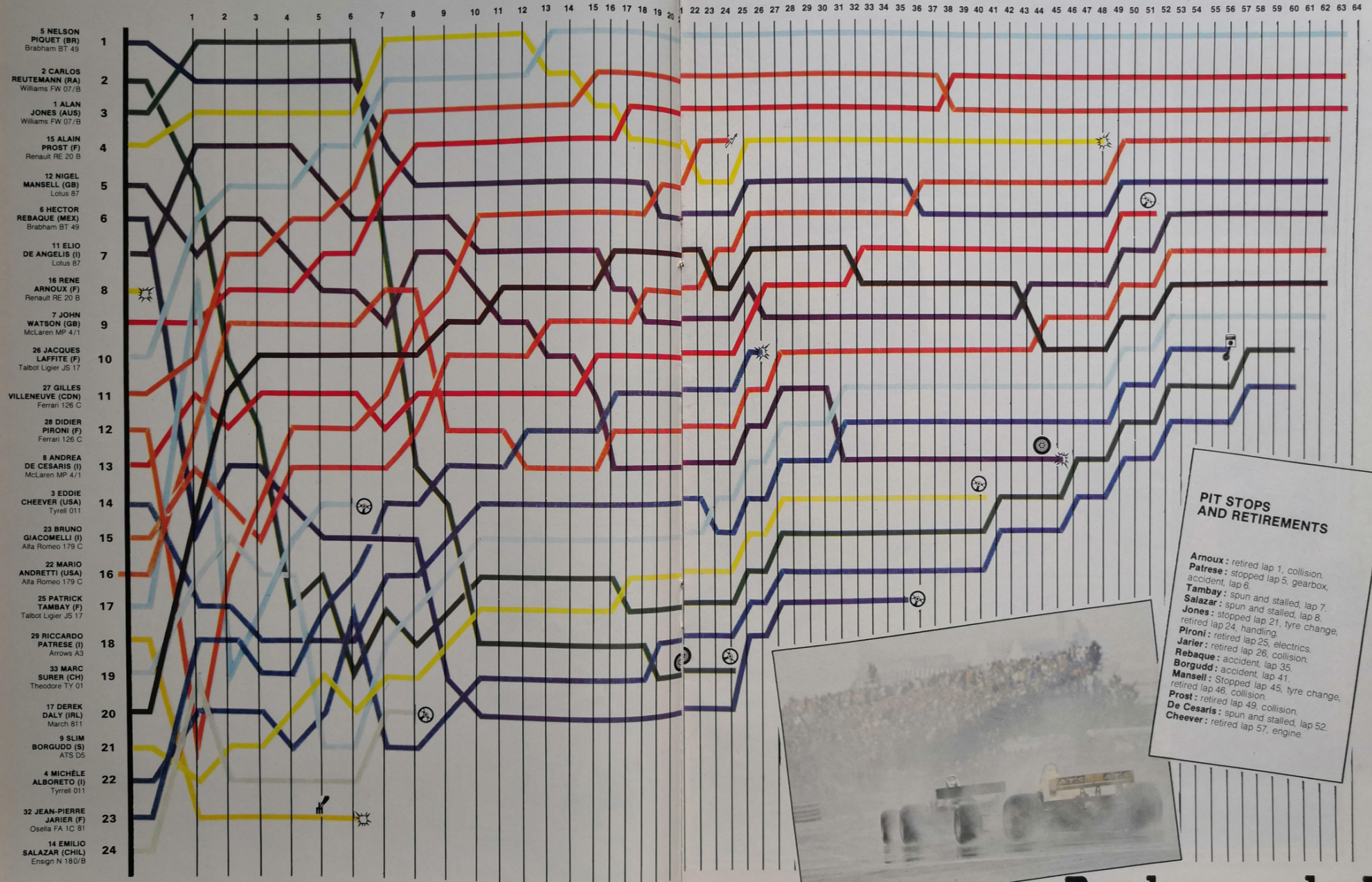
Lap by lap - Giro per giro - Runde um Runde - Tour par tour - Vuelta a vuelta - Ronde

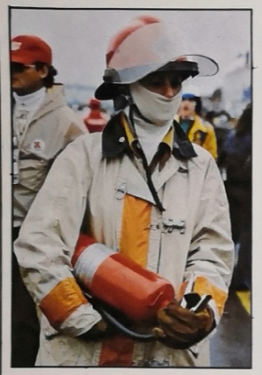


PIT STOPS AND RETIREMENTS

Arnoux : retired lap 1, collision.
Patrese : stopped lap 5, gearbox, accident, lap 6.
Tambay : spun and stalled, lap 7.
Salazar : spun and stalled, lap 8.
Jones : stopped lap 21, tyre change, retired lap 24, handling.
Pironi : retired lap 25, electrics.
Jarier : retired lap 26, collision.
Rebaque : accident, lap 35.
Borgudd : accident, lap 41.
Mansell : Stopped lap 45, tyre change, retired lap 46, collision.
Prost : retired lap 49, collision.
De Cesaris : spun and stalled, lap 52.
Cheever : retired lap 57, engine.

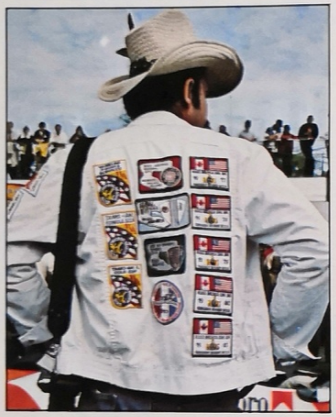
Giro per giro - Runde um Runde - Tour par tour - Vuelta a vuelta - Ronde na ronde - La

Postcard from Montréal



The lady may light your fire, but what she's carrying will extinguish it

No contest: the Ferrari Mondiales lent to Villeneuve and Pironi line up against a local tram



Reflections of a pit lane

If you can't beat 'em, join 'em: Jones joins the French police force, and it looks like his first arrests might be Laffite and Tambay

A Renault supporter to his toes

Andretti's Alfa gets in some practice at blocking Laffite's Ligier. It was put into effect in the race

Remember galoshes? They were popular for keeping dry gentlemen's spats, but the Grand Prix brigade use them to keep their driving shoes dry

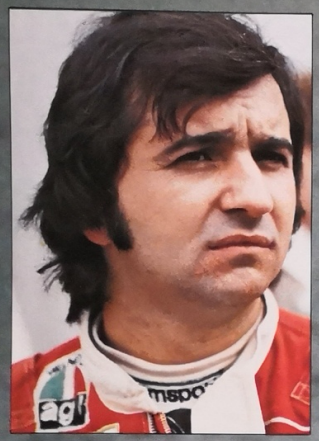
Easiest way around the Montreal circuit is by boat

Reutemann could count on at least four supporters in Canada

Another badge freak

Mario's son Mike Andretti led the Formula Ford race for a while, but Scott Goodyear won

Pironi learns how to win friends and influence people: pose as Gilles Villeneuve



BRUNO SAVES HIS LOCKS

The threat of a losing his long black hair did wonders for Bruno Giacomelli at Montreal. Gerard Ducarouge promised him before the race that "if you haven't won a point after Las Vegas, I'm going to cut your hair as short as mine." The scissors threat looked menacing on Friday evening, for Bruno's Alfa was only 23rd fastest. Furthermore, a side pod had broken on his race car, and the fuel pump had broken on the spare. The next day, Bruno qualified 15th fastest, but he was optimistic as he'd set his time on race tyres. And as at Monza, the rain came to his aid. The Alfa ran like clockwork, and Bruno climbed through the field from 13th to finish fourth in front of Piquet. (Photos Weber/SAM - Bernard Asset/A + P)

PIQUET: STILL IN THE HUNT

As in Brazil, the rain at Montreal considerably dampened Nelson Piquet's championship hopes. But of all the handicapped Goodyear-equipped drivers, it was Nelson who finished the highest, in fifth place. Two more championship points means that he will start the final round of the championship virtually level on points with Reutemann. Nelson set the fastest time in practice. Gordon Murray's men had obviously prepared the car to perfection. Under normal circumstances, Nelson would have won many more points. (Photo Bernard Asset/A + P)

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WATTIE RESURFACE

John Watson's last few races haven't reproduced his mid-season results, but in the Montreal rain, Wattie was back in the points again. With a certain amount of help from Michelin's superb wet weather tyres, and his own natural talent in the rain, Wattie finished a good second. He started prudently, letting the rest settle down, and soon found himself behind Villeneuve's Ferrari. "I expected something would happen to him. I knew that I would get by." And overtake he did, on the 38th lap to finish second behind Laffite. (Photo Bernard Asset/A + P).

PROST : MISSION ACCOMPLISHED

Alain Prost had a difficult job to do at Montreal. Gérard Larrousse wanted to demonstrate that the RE30 could be just as competitive on low speed circuits as on the faster ones. And Prost proved the point.
No one could believe it when he led the race on the seventh lap. A Renault was in front, on a circuit that was supposedly to a turbo's disadvantage, but also on a wet track which made it harder for the driver to handle the turbo engine's power.
Prost had already won one battle the previous day in qualifying his Renault on the second row beside Jones. He went on to lead the race after Jones had spun. But then Prost had a brake problem which caused him to drop back. Even so, he held off Laffite for six laps before having to allow him past, and Villeneuve and Watson got by a little later. Prost was in a safe fourth place when Mansell knocked him out of the race. His championship hopes followed the rain down the drain, but the Canadian race was one more reason why Prost should be optimistic for next year. (Photo Bernard Asset/A + P)

DE ANGELIS: PROMISE DAMPENED

When Elio de Angelis set fourth fastest time on Friday morning during the first unofficial practice session, it looked as though Lotus were in for a good weekend. Mansell confirmed it with second fastest time on Saturday morning. The light, compact Lotus 87s were obviously suited to the tight Montreal circuit, as they had been at Monaco. But then the rain washed away their hopes: the Michelins were much better than Lotus's Goodyears. Even so, de Angelis stayed on the track and he salvaged a fine sixth place. (Photo Bernard Asset A + P)

GILLES VILLENEUVE

FACE TO FACE

For the past three years, it has become almost tradition for us to interview Gilles Villeneuve at the Canadian Grand Prix. Many consider him the fast man in Grand Prix racing today. But why hasn't he won the championship? What problems prevent him from doing so, and how does he solve those problems? The same questions arise each year, yet the man himself seems just as determined and his talent remains as obvious as ever. But now there's a difference: as years go by Gilles is becoming more and more impatient.

by Eric BHAT

Although you've won two races this year, the Ferrari team has had a lot of problems recently. Overall, do you consider this season to have been positive or negative?

It's been negative in that at the beginning of the year I thought we'd be a lot more competitive. I thought we'd be constantly among the top five or six. We were supposed to have an advantage with our much publicised new turbo engine, and we should have had better ground effect than we had with the T5. But it didn't turn out that way, except perhaps at Imola where we were fairly competitive. But at that time, the hydraulic suspension cheating wasn't in full swing, and our ground effect handicap wasn't too great big. Once everyone had got their trick suspension working, we slipped further back. After we'd won at Monaco and Spain, the supposed experts made us favourites to win the next Grands Prix because they would be suited to turbo power. But the cars' handling hadn't been that good up to Spain, and I couldn't see why it should be that much better in the next few races. I was far from optmistic.

You didn't win those two races by chance. They were very promising, for at that time, the 126 C was fairly new.

Circumstances played their part on both occasions. We were competitive during practice at Monaco. But we deserved to finish fourth or fifth in the race. Fortunately there were a number of retirements which meant that I won. By Spain, the suspension cheating was in full swing and we had begun to suffer. I was fourth or fifth fastest in practice, but that was thanks to the engine. I made a superb start in the race, Jones went off and I won: the right chain of circumstances with a bit of luck. If I'd been seventh at the start, I would have remained seventh and I wouldn't have overtaken anyone. The car didn't deserve to win. I'n not saying it was because of me that the car won, but I think I had something to do with it.

Even though you weren't optimistic after Spain, didn't you think that the turbo engine would be an advantage on the next few quick circuits?

Yes, I did think it would be an advantage, but only up to a point. In fact we realised that a Ford Cosworth engine in the back of a car with little wing wasn't a lot slower than we were. We were only a couple of miles an hour faster than a Brabham for example. You don't win races like that, especially when you're eight miles an hour slower in the corners. At the same time, the Renault team had improved their turbo which was just as powerful as ours but had less turbo lag.

Our big disadvantage was our roadholding. It's very mediocre, and sometimes it's been even worse than everyone else's. I didn't expect our handling to be the best at the start of the season, but I didn't think it would be quite so bad. I hoped that I'd be a front runner and that I might win one or two races. I've won those two races, OK, but the rest of the time I've been a regular mid-field runner. We've practised well, but during the race, it's been just like it was with the T5. We've steadily dropped back to around 10th place in most races.

Were those two wins perhaps a disadvantage in that perhaps they hid certain problems? Did you win too early in the season?

No, I don't think so. On the contrary, I think our wins gave the team some hope which encouraged the personnel to work harder. No one in the team has rested on the laurels of those wins. The only excuse that I think we can claim is that it's difficult to built an engine and imagine the size of the radiators and intercoolers etc, while at the same time building a good aerodynamic car. Perhaps we didn't really concentrate on a neat aerodynamic car. It's easy to say, but I think we could have done better. The right way to do it is to go into the wind tunnel and to build the car according to the results obtained there, even if it means slight engine alterations or changing the transmission. There's one thing that all the better cars have in common: a narrow gearbox and well positioned side pods.

Some of them may not be competitive, but one thing's for certain: all the leading cars have narrow gearboxes and wide side pods... things that we don't have. That was our mistake from the start. We're going to have to put that right for next year.

A lot of people say that nobody else could have won in a Ferrari at Jarama. Was that your best race of the season?

It certainly was, and perhaps even one of the best of my career. I would like to think that no one else could have won in a Ferrari that day, but I suppose other drivers would have been capable of winning. Everyone has their 'on' days. It was a good race for me. It's easy to say that I had a power advantage and that allowed me to stay in front. But the car was virtually undriveable, it just didn't handle. It's not easy to stay in front for 80 laps without making too many mistakes - and I made a few.

How do you feel about next season? Do you think that Ferrari could win the championship in 1982?

Yes, but I thought the same thing this

time last year. Let's say that I feel that I have the proof that I could win the championship next year. We have a good engine. What we have to do is develop an efficient aerodynamic chassis. I think that we should be able to do that.

From time to time you've had some pretty harsh words for Ferrari's technical men. Was this frustration or anger?

It certainly wasn't anger. Impatient I might be, but that's only to be expected, and perhaps I've shown it from time to time. But contrary to what some people think, there hasn't been a lot of shouting in the team this year. Yes, the car could have been better. When you consider all the facilities that we have at Ferrari, to have the worst chassis in the field for a number of races is pushing things a bit far. If it was Ensign or ATS, it might be excusable, but at Ferrari, it's hard to take.

You were driving with Ferrari when the team won a number of races. Now, apart from your two wins earlier in the season, it's been a lean year. Is the atmosphere getting rather tense?

We're more tense, but we still have our feet on the ground. We know what we're dealing with in terms of car and problems and we know how to make things better. So we're not beating our heads against a brick wall. If we spent too much

time modifying the current cars, we'd jeopardise next season's plans. We've made some temporary modifications, but we don't have the time to change the whole car. Let's wait until next year.

What's the story behind the telex conversation between yourself and the Commendatore after the Austrian Grand Prix? Have you had some sort of disagreement?

As you say, it's a story. After each Grand Prix, I send a telex to Ferrari giving him my impressions of what has happened during the previous weekend: it went well, it was dreadful, the car did this or that. I try to give my own, honest impressions as a driver. After the Austrian Grand Prix, I sent him the usual telex in which I explained that I'd crashed and that it was my fault, something which perhaps I didn't explain well to the Italian press. Ferrari replied, saying that it was good that I had admitted my mistake, but that he didn't hold it against me because he knew that I drove hard all the time.

The press pushed him to say what he thought of the accident, so he published his reply to my telex, and some journalists saw it as a rebuke when in fact it was absolving me of all blame. But to prove that there had been a telex conversation between us, Ferrari has shown a few journalists the telex that I orginally sent. Anyway, there's never been any bad feeling between Ferrari and me.

Do you converse regularly by telex with Enzo Ferrari?

Yes, regularly, but not only be telex. When I go to Fiorano, we talk a lot together, much more this year than previously. It's built up gradually. When I first drove for him, I scarcely knew him at all, but now we get on very well.

I can talk with him very openly and honestly. I've even had to tell him that on certain circuits, the car is the worst in the field. Anyway, I don't need to tell him: he knows it already, he can see it on television. At certain times, you only have to watch TV to see that our car's roadholding is very bad.

You have already signed to drive for Ferrari in 1982. You signed in May, don't you think this was too early? Are there not times when you regret this?

Taking into account the current situation in Formula 1, you could say that I'd signed too early because I'm bound by contract to Ferrari, should I want to join Williams or McLaren for instance. But on the other hand, if I really wanted to leave the team, it wouldn't be impossible. A contract is only a piece of paper, and there is always room to negotiate. When you no longer want to drive a car, you don't want to drive it, and that's that. If I hadn't signed with Ferrari so early, I'd be on the market at the moment, and I might have been able to get more money from Ferrari, but that's not important. Certainly, during the season, when the car was no longer competitive, I had second thoughts when I saw how well Renault,

Williams or Brabham were doing. But these were only temporary regrets. What's done is done, and it's not the end of the world.

There has been some talk about the possibility of Williams taking over your Ferrari contract. Is it a real possibility?

You may think that there is some truth in the rumours. But if people think that I'm a good driver, it's only natural that they should talk to me. I'm not deaf. They can talk and I'll listen. All the same, though, there's a lot of difference between them talking to me, and me talking to them...

You've now driven for Ferrari for four years. It would be quite understandable if you wanted a change of team.

Four seasons, and two of them have been bad. But I work well with Ferrari, I like the team. The only way I would leave Ferrari would be if I could be certain of driving a better car. But how can you be sure? At the risk of having nothing better, I'd much prefer to drive for Ferrari for as long as possible. Contrary to what some people have said of him, he's the most humane of all Formula 1 team patrons.

But driving doesn't just mean racing, but also testing. You've done an enormous amount of testing at Fiorano in the last four years, and you go back time after time. Don't you think there's a risk of you reaching a saturation point?

We don't test for fun at Fiorano. It's always constructive. If we try things in testing that are likely to improve the car - new skirts or tyres for example - and make us quicker, than I appreciate the fact. But endurance driving is not so great. Driving round and round to work out fuel consumption or brake wear isn't any fun. I've done a lot of laps now at Fiorano, and I suppose the challenge has faded.

Do you still feel that you, personally, are making progress, that you're still learning?

Yes. Firstly I find that I can work out whether the car is progressing or not much quicker when we're working on it. Secondly, and it's here that I find I'm making the greatest progress, it's that I can get myself out of a fix much more easily than previously.

For the last two seasons, you've been driving a car that isn't totally competitive, and yet you're just as aggressive as before. Other drivers might have eased up, why not you?

No, I haven't eased up, I'm driving as hard as ever. That's because if you do ease up, I don't see how you can put the pressure on again once you have a good car. Either you drive hard or you don't. I can't see that there's anything in between. But I hope that a good car will come along before people start saying that I've lost my touch. Ronnie Peterson was always the quickest driver of his time, but when he was in an uncompetitive car, people said that his sliding technique was losing him time and that he wasn't as quick as before. They were wrong, of course, because he amply proved that with a competitive car, he was still the quickest driver around. I hope people don't think the same of me.

Is it any different in the team now that Didier Pironi has replaced Jody Scheckter as your teammate at Ferrari?

Nothing's changed, really. Jody and I used to ask for the same set-up, and it's virtually the same with Didier. I get on as well with Didier as I did with Jody, and I think that Didier's joining the team has been as good for the team as it has been for me. When we weren't very quick last year in the T4s and T5s, some people might have suspected that it was the drives who were to blame. Didier joined the team as a well-respected and quick driver and proved that it wasn't the drivers' fault that we were uncompetitive.

Is your brother Jacques a driver in the same mould as yourself? What do you think of him? Are you giving him some advice?

I think I helped him more at the start of his career. All I've said recently is that he deserves a drive in Formula 1. I haven't any advice for him now, except that he should do what he wants to do. Once he's in the car, he mustn't take any notice of someone who tells him to go slower or quicker. But honestly, I don't think he's going to be as good as I am. But that's quite natural. If you asked him the same question, he would probably say that he's better than I am.

You've now lived in France for four years. At the start, you missed hamburgers, for example. Are you enjoying the French way of life more now?

Don't dwell on hamburgers!! To be honest, I don't think anything can rival the American way of life. But I'm used to France now, even if it is still impossible to ring up for some milk and pizza and have it delivered fifteen minutes later. Life in America is easier.

Finally, can we talk about safety? You seem to be a very active member of the GPDA, but you haven't taken over where Jody left off. Why?

I don't think I have the knowledge, nor the political ability to take over from Jody. I'm more a man of action than of politics. I would hate having to write 52 lettes to get things done, or to get down on my knees to plead for something. If there's a positive move to be made, then I'll give it my full support, as I did in Belgium. I'm not a striker at heart, and I hate demonstrations, but when I feel that there is a way of making oneself heard, then I'll go for it. □

Patrick Head in his garden - where perhaps he got the inspiration for William's six wheeler (Photo David Winter)

PATRICK HEAD: THE RACING PROFESSOR

A placid exterior, but Patrick doesn't like losing... (Photo David Winter)

If it wasn't for his slightly heavy-weight appearance, Patrick Head would be worth his weight in gold. Since Frank Williams had the foresight to place all technical responsibility in Patrick's capable hands, the Williams team has gone from strength to strength. For behind Patrick's "comfortable English gentleman" exterior lies an astute and talented technician, to which, these days, is added the ability to be an excellent administrator. There is but one drawback to this traditional upper-class English intellect: a tendency to be absent-minded...

by Mike DOODSON

Colleagues claim that Patrick Head spends only *"about three minutes per day"* in his office at the factory in Didcot where Williams Grand Prix (Engineering) Ltd is situated. Head says it's because good administration is the fundamental basis of success in racing, and good administration is probably the single most important factor which he has been able to bring to Frank Williams's team. He turns up at Didcot every day of the week when the team is not away at a Grand Prix, and the mechanics sometimes find that he's helping to make parts for the cars.

The other engineers at Williams joke that in all the bustle from workshop to wind tunnel, their best chance of catching Patrick's attention is to stop him en route. *"Some of our best ideas have been hatched on the stairs,"* they say.

He has another reputation too, for like the proverbial absent-minded professor, Patrick tends to forget things. He left his briefcase in the queue while going through customs on arrival at Montreal for the Canadian GP and the mechanics believe that he left a suitcase of spare parts in the lobby of his hotel, though Head denies it. But he did once overturn his car on the way to London's Heathrow airport, as likely as not because he was concentrating on some bright new idea.

It was a memorable incident, if only because he still managed to catch his flight.
He retains a detached coolness at all times, even when he's in the pits with lots at stake before a vital race, but his nervousness is evident in some of his gestures. For example, he constantly pulls his green sweater over his slacks... and pretends that he's flustered when journalists ply him with questions. There is only comparatively narrow circle of pressmen whom he takes seriously, and anyway he hates to see himself quoted in print.
When he does speak, however, he is extremely listenable. He takes minute pains to explain engineering detail and has a pithy contempt for those who have interfered with the technical regulations of the current cars, especially the drivers who initiated those changes. *"It's a pity,"* he says drily, *"that people like Scheckter aren't around to experience the discomfort of these cars."*
He ducks questions about whether he prefers to be an engineer or an administrator. *"I'm happier as an engineer,"* he insists, *"but when you're operating a company with more than 80 people, one has to be, well, at least competent as an administrator. Basically, the part that I play is just a logical part of getting the job done."*
Time spent on designing a racing car *right* means time saved later, and the Williams FW 07 is the best possible example of this approach. So exactly how do Patrick and his team of engineers and draughtsmen set about the task of designing a new car?
"I'm not sure I can remember," he jokes, *"because it must be about three years since we did one! But the basis of all the cars at the moment, the factor that dominates, is the aerodynamics. So obviously we spend a lot of time there, and the structure of the car and its layout are subordinate to the aerodynamic function."*

It cannot be easy for a burly man like Patrick to work alongside the lean and athletic Frank Williams, who runs at least five miles every day of his life. He is nevertheless a stern disciplinarian with himself, in matters of diet, avoiding breakfast and taking only a light midday meal. For most of this year he has been on a strict diet, something which is not easy when one's life centres around hotels and airlines with attendant temptations. Having given up smoking several years ago, he has become a devout campaigner against the weed. Just like a religious convert, he now abhors his former habit, and draughtsmen in his office dare not light up when they know that he is in the factory.
The chances are that motor racing has yet to see the best of Patrick Head. When he designed the current FW 07 chassis, he freely admits, what he had in mind was a "Lotus 79-type" car. Wind tunnel tests on both Lotus 79 and Lotus 80 body configurations indicated that there was more aerodynamic downforce to be had from the complicated type 80. But the decision to stay with a 79-type configuration followed automatically when it was found that the Lotus 80-type car would have been twice as difficult for the mechanics to maintain. At that stage, Patrick saw easy maintenance as an important means of improving reliability and therefore of winning races. Two years' experience with the FW 07 has entirely justified that decision. *"I see no point in being an innovator,"* said Patrick at the time, *"when it's possible to extract more from an already proven configuration. Nobody wins world championships by just being an innovator."*
But from now onwards, with the Cosworth V8 engine already being eclipsed by the turbos, the accent will turn to establishing a technical lead to capitalise on turbo power. First though, and true to his own philosophy of extracting the maximum from aerodynamics, Head is almost ready to spring his experimental six-wheeled car on the world. Its four, narrow rear wheels will make it possible to generate even more downforce, with less drag, than the current FW 07. It has been tried before in different ways, by Tyrrell with the front wheels and March with the rears. It would be surprising if Patrick had not learnt something from useful from both those experiments to build a much more practical car.
There is also a turbo in the future of the Williams team. Whether it is European or Japanese, nobody yet knows officially. But it will present Patrick Head with a new challenge, one that will test to the full both his engineering brilliance and his administrative abilities. He would never admit it himself, but he would not stay in racing if he did not believe that he could beat Renault and Ferrari at their own game. He sets his sights high and by his own admission hates to be beaten.
Patrick Head's future promises to be even more interesting than his already outstanding record. No doubt his team hopes that the absent minded professor will not manage to lose the drawings of his new project in some distant hotel lobby where they could be picked up by one of his rivals...
Unlike most other major teams, the Williams team has no fewer than three senior enginers. One of them, Frank Dernie, is assigned the time-consuming task of looking after airflow and related tasks (a job which was eased earlier this year when the company acquired its own moving-floor, quarter scale wind tunnel.) Neil Oatley is in charge of mechanical parts like gearboxes, suspension and wheels. And Patrick himself is in charge of the chassis design. *"But we're not a committee,"* he insists, and his colleagues agree: *"if Patrick doesn't like anything we've done, he changes it,"* they say. And the proof of the respect they have for him is that he's usually right.
Even as a teenager, Patrick saw his future behind a drawing board rather than a steering wheel. His father had been an amateur racing driver in British national events, while young Head's own ambitions as a driver were even more modest. They were dispelled completely a couple of years ago when he was persuaded to try one of his own F1 Williams chassis at Silverstone. *"It seemed OK at low revs,"* he remembers, *"but when I put my foot down on the straight the engine suddenly produced about a million horsepower. It felt to me as though the end of the world had arrived."*
An early fascination with the sea, coupled with his engineering bent, led him to join the Royal Navy in the hope of pursuing his studies as an officer. Within a matter of months he knew that he had made a mistake: all he will say is *"I left of my own choice."* And so to University College in London, where he acquired his abilities at his own pace. *"It was just fundamental engineering, with a good theoretical grounding in all the sort of things that an engineer needs. And like all the best engineers I only got a second class degree."*
"It's a long time ago now, you know," he insists (though he's only 34): *"but I think I went to University with a pretty firm intention of going into motor racing. I wanted to apply the knowledge I had gained to racing... because I didn't really like working."*
His interest in the sea, however, had not ceased with the somewhat abrupt departure from the Senior Service. A project that remains close to Patrick's heart is the two masted schooner which he has been keeping at Brig[illegible] marina. Its most fascinating feature is its hull, made not of wood or glassfibre but cast in concrete. With its teak decking and full equipement, installed by Patrick himself, it is a valuable and impressive vessel: its owner wishes he had more time to devote to it.
It could hardly be said that Patrick is an athletic looking person, yet when he turns up at the factory on summer weekdays, he's invariably wearing shorts, having arrived from a hectic game of tennis at Frank Williams's house. His own home, five miles from the team's HQ, is a lovely English country house at Aston Tirrold which he shares with his wife Kate and a pair of boisterous dogs. Appropriately enough, they are Australian terriers. Both Patrick and Kate have very definite ideas of homemaking, and when our photographer was visiting them for the accompanying photographs, he found that part of the lawn was in the process of being lowered ten inches, a formidable operation to please Kate's perfectionist ideas which Patrick grumbled had turned the place into a bomb site. The house is invariably full of dogs and children, for Kate often 'dog-sits' for friends and welcomes young visitors like the three daughters of Patrick's colleague Frank Dernie. □

The different sides of Patrick Head's life: getting down to the job at a circuit, long hours at Williams's factory of Didcot (here with assistant Neil Oatley), or relaxing at home beside his swimming pool or in his garage where he looks after a Williams FW 06 (Photos David Winter - Bernard Asset/A + P)

EXTRA, EXTRA

DALY BIDS FOR MARCH... 1982

Derek Daly lay stretched out on the floor of the March pit on Sunday morning. Hands clasped on his white Simpson tunic, he thought about his short conversation with Frank Williams earlier in the day.

The discussion? Well, there was none really. Frank had come straight to the point: he had a driver in mind to replace Jones so there was little to be gained in pursuing the subject further.

"That was fair enough," mused Daly. *"At least I know what's happening. Nothing ventured, nothing gained. It's understandable, I suppose, it's been difficult to prove a point this year. But one day..."*

Dusting himself down, he peered into the silent pit lane as the Grand Prix circus chatted, their gossip unimpeded by Formula One engines while the insurance problems were sorted out. In the background, dark clouds were gathering on the Montreal skyline. *"Looks like rain,"* observed Daly. *"That'll suit me fine."*

Derek Daly's wet weather reputation was gained largely by a daring performance during the 1978 International Trophy at Silverstone when he pushed his Hesketh through the spray to lead established stars such as Hunt, Andretti and Depailler.

The reputation has since flourished on various streaming tracks yet Daly admits to a dislike of racing in the rain. *"I don't like it. I mean, how can anyone say they enjoy racing in wet conditions? It just happens that I seem to go well and it doesn't bother me too much. The problem is aquaplaning because drivers have no control over their cars under conditions like that."*

Buckling down for the warm-up, Daly found the March to be twitchy - but controllable. *"It would jump sideways in the pools of water but I could hold the car, no problem. So I knew I would be OK. The important thing for me was to make up as many places as I could before the first Esses because, after that, the spray would be too much.*

"I got by Surer and Patrese and then took Cheever on the way into the first right hander. Then I was behind a couple of Marlboro cars but the spray was too much".

After this initial burst, Daly settled down and picked off de Cesaris, followed by Reutemann. *"I came across the Williams on the pit straight and I was surprised that I was able to pass the championship leader so easily."*

The two Lotus cars were next, the March racing into seventh place by lap 16. *"The Lotuses seemed to be braking very early so my attacking point was under braking at the hairpin both times. I had a quick 360 degree spin but kept going and didn't lose any places. Then the back brakes started to go about halfway through the race. I wound more balance to the rear but the fronts kept locking. In fact, I went over the grass three times trying to stop the car! On top of that, the Avons couldn't cope with the drying line so I knew it was hopeless to try and keep Andretti and de Angelis behind me."*

More than anything, Daly wanted to finish this race after his recent disappointments but his pulse soared when the oil light flickered for about ten laps. Fortunately, it was no more than an electrical fault and the DFV ran until the end - giving Daly and the Guinness/Rizla March team their first non-stop race all season. Eighth place may not have been worth championship points but Daly's ability in appalling conditions had scored a personal point or two Sunday afternoon on a wet Ile Notre Dame.

Maurice Hamilton

BIBENDUM LAUGHS AT GOODYEAR

To summarise the complicated events of the weekend in Montreal, as simply as possible, is easy. Goodyear won the "dry" battle to qualify in the dry, but Michelin won Sunday's war in the wet even more convincingly. *"I have to admit that it wasn't the car, nor even the driver that won today,"* confessed Jacques Laffite, *"it was the tyres. Thanks a million, Michelin!"*

But while Goodyear had promised their customers that there would be "something special" for them in qualifying (a promise they fulfilled by putting six of their cars in the first seven places on the grid), nobody at Michelin would have been brave enough to forecast that their wet weather tyres would be so well suited to the conditions on Sunday afternoon. Indeed, in the first few laps of the race, as the Ile Notre Dame circuit dried out, it was Alan Jones on his Goodyears who had the tyre advantage. It was only when the rain started to tumble down again, leaving deep puddles on the track, that the Michelin users, first Prost and then Laffite, were able to get the upper hand.

The tyre makers all regard the business of manufacturing wet weather tyres as a gamble, an expensive gamble. *"We have to carry three hundred rain tyres to every race,"* said Goodyear's Lee Gaug. *"They're expensive to develop, a lot of weight to transport... and after four or five months in storage the rubber goes hard. So if you don't use them they have to be thrown away."*

In the two warm-up sessions that preceded the Canadian GP, the second of them in extremely wet conditions, there was so much chopping and changing of tyres in the Williams camp that by the time the grid formed, Carlos Reutemann had two cars on the front row each fitted with different types of Goodyear rain tyre, while he tried to decide which of them he was going to use.

The choice was certainly a difficult one for the Williams drivers, and especially for a perfectionist like Carlos. With a lack of subtlety, a huge inflated "Monsieur Bibendum, the Michelin man" had been placed for the weekend over the pits allotted to the Williams and Brabham teams. There must have been a grin on his pneumatic face as he stared down on Carlos's dilemma, which resulted in him switching a pair of rear rain tyres from the spare onto his race car (he had managed to do a couple of laps in both) only moments before the start of the final parade lap. Perhaps the tension got through to Carlos on that lap for after two days during which he had remained relaxed and smiling, his car crept forward on the grid and when the green light at last came on, he was actually ahead of poleman Piquet.

Alan Jones managed to find a way past Carlos on the run down to the first corner and led the race for six laps. But fresh showers soaked the track, and the super-soft Michelins, which would surely have disintegrated had the track continued to dry, came into their own: first Prost took the lead, then Laffite. In the deep puddles, both Williams drivers found their cars unmanageable. Jones was so concerned about the handling that he stopped for a tyre change. It didn't improve matters and when he made a second stop, he was instructed to retire by Frank Williams who feared an accident if he continued.

Reutemann was in an equally difficult position, though he persevered. He was able to joke about his problems afterwards, not without a touch of irony: *"I still can't believe that I finished,"* he said: *every time I went into a corner and managed to get round without spinning off was a miracle."* He pointed to his tyres, which looked as good as new. They must have been aquaplaning for most of the 63 laps...

The race had been only slightly easier for Nelson Piquet. Because the Brabham team uses 13 inch front wheels, Goodyear had been able to put him on some of their moulded "gatorback" front tyre, which have a more suitable tread for heavy rain. He would have finished one place higher, in fourth position, if it hadn't been for a fault in the electronic timing which erroneously showed Bruno Giacomelli more than one lap behind him.

"My pit didn't warn me," said Piquet as he rushed to his plane afterwards, *"so I moved over like a gentleman and even waved Bruno through."* The Brazilian was not too pleased with the Italians who challenged him at Montreal for he was almost taken out of the race by Andrea de Cesaris when there were only twelve laps to go. *"I was lucky to see him trying to outbrake me impossibly late at one of the chicanes,"* said Nelson, *"and I was able to hold my car."* A big black mark on the side of the Brabham indicated how lucky he had been to be able to continue.

So, frustation for some, delirium for others ... and a lot of dangerous moments which several drivers blamed on the poor quality of the Canadian flag marshalling. But the most disappointed man in Montreal was surely the one in a smart blue Goodyear jacket. *"Only one thing for it"*, said Lee Gaug, biting on the stem of his ever present pipe : *"next time we come here, we're going to have to make some special rain tyres just for this damn circuits".*

Mike Doodson

TURBO-CHECK

There are currently five turbo engines either running in Formula 1 or destined to appear in the near future. They may all be boosted by turbochargers but they're very different: BMW and Hart use four cylinder engines, Renault and Ferrari have V6 engines, and Alfa are working on a V8. What are the individual advantages of each engine? Separate figures and tables may help you to draw your own conclusions.

by Enrico BENZING

The main centre of interest of a turbocharged engine is purely theoretical. The pressure and heat from the exhaust gasses are used to obtain a slight improvement in thermic cycle. In practice, the Formula 1 world is interested in the greater power output at high revs guaranteed by turbocharging. But a boosted engine's advantage can't be measured in thermodynamics, because as well as a reduced cubic capacity, there are a number of disadvantages to a turbocharged engine in comparison to a normally aspirated version:

- Slow engine response in acceleration
- Low power output at low revs, directly related to the turbocharger's rotations
- Lack of turbocharger reliability, as it turns at around 135,000 rpm
- Difficulty in finding the right air/fuel mixture for all conditions, and also cooling
- Heat build-up and mechanical loads using current metals.

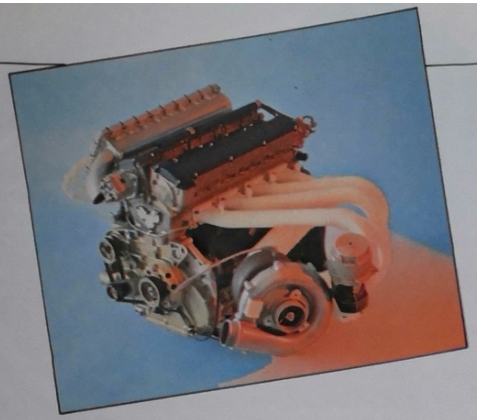
All the same, the perpetual search for power has tempted more and more Formula 1 teams to opt for turbocharging and to face the challenge of solving the problems. But say a turbocharger gives an extra 70 bhp, this would raise a car's speed from 174 mph to 183 mph, using a co-efficient of 1.4 worked out on the basis of a car's frontal wind resistance multiplied by the French CX formula. By that, it's clear to see that the evolution of turbocharged engines is beginning to threaten the formula of equivalence so cirticised by Ken Tyrrell. It currently stands at two to one, 1.5 litres to three litre for normally aspirated engines. Ten years ago, it might have been absurd to use a turbo engine with this equivalency, but now it is the reverse.

It's interesting to note just how the technicians and engine designers have solved their problems, and what the future might bring them. Turbo lag has been considerably reduced. This has been achieved by first of all mechanical fuel systems, and later electronic systems. The aim has been to maintain both power and torque curves, taking into account the variation in power output depending on the turbo's output, at the same time enlarging the power output range and using fuel to the best advantage. In short, the engineers have tried to get as much boost pressure from the turbo, giving maximum power all the way through the rev range. These are the boost pressures to which the various engineers admit:

Engine	Press, kilos/sq cm
Ferrari	1.9
Alfa Romeo	1.85
BMW	1.8
Hart	1.8
Renault	1.7

So the two atmospheres barrier (relative pressure) used by the old superchargers is still unchallenged, but the new engines work on petrol, not alcohol as in the days of the superchargers.

The basic construction of engines is becoming more and more diversified, making the various bores and strokes of considerable interest in comparing the construction of the engine, its power, rev range and torque. Ferrari and Renault go for six cylinders, BMW and Hart have



four in-line cylinders, and Alfa Romeo have their V8. The V6 is an intermediate solution: the four cylinders need better torque, and the eight cylinder need more power at the top end of the range. Their maximum power and the revs at which it is attained is revelaing:

Engine	Power	Revs
Alfa Romeo	585	11,200
Hart	580	9,500
Ferrari	565	11,000
BMW	557	9,500
Renault	550	10,800

In terms of specific power, in bhp per litre, the influence of the number of cylinders used is already apparent. But the table giving the output per thousand revs indicates better the degree of output attained. This table gives an idea of volumetric power, in direct relation to heat build-up and mechanical demands.

engine	bhp/litre	bhp/litre x 1000 rpm
Hart	387.45	40.80
BMW	371.38	39.09
Alfa Romeo	390.96	34.90
Ferrari	377.57	34.32
Renault	368.71	34.14

The torque figures obtained give pretty much the same results:

Engine	Torque kilos/metre	Rpm
BMW	43	8,500
Hart	41.5	7,500
Ferrari	40.1	9,000
Alfa Romeo	39	10,000
Renault	38	9,600

But these days it isn't difficult to obtain higher torque figures, independent of the number of cylinders or their bore and stroke. The power band can be changed much easier with a turbo than a normally aspirated engine. This may be better understood by using an internal elesticity index $I_e = (1 - \frac{\text{Maximum torque/revs}}{\text{Maximum-power/revs}})$:

Engine	I_e
Hart	0.210
Ferrari	0.182
Renault	0.111
Alfa Romeo	0.107
BMW	0.105

More and more, the engine men are adopting electronic ignition to work out corrected air fuel mixtures taking into account the following factors: butterfly position; engine revs; turbo boost; temperatures. Alfa Romeo's idea to use eight carburettors, specially designed by Dellorto (one for each cylinder) is viable for research purposes, providing they can cure any centrifugation problems. It allows the engineers easy control of the air fuel mixture.

What is important is the positioning of all the surrounding elements for a turbo engine, and ensuring reliability. The choice of two turbochargers for a V engine is one way of ensuring reliability, because it means that the turbine itself is that much smaller.

In fact much of the immediate future progress may well surround the turbos themselves. The turbocharger designers will be looking to reduce inertia, improve mechanical output and to improve function at high temperatures. To the latter end, they will be looking to ceramics and improving lubrication.

The considerable boost pressures currently being used puts new strains on the engine. It means that further development has to take place on the interior mecanical parts, which will suffer greater heat build-up and mechanical strain. In the final table, the upper surface of the piston is studied, from which it is possible to calculate the amount of horsepower per square centimeter. This is a proportional figure, taking into account the average effective pressure, the friction of the piston allied to the terminal pressure in the combustion chamber. These are the figures obtained from current engines:

Engine	Surface of piston cm²	Bhp/cm²
Renault	348.5	1.58
Alfa Romeo	344.1	1.70
Ferrari	309.2	1.83
BMW	250	2.23
Hart	243.3	2.38

So the greater number of cylinders the better: eight or even twelve would be advantageous, although a manufacturer would have to try to avoid a low bore/stroke ratio such as Renault's. It's a complicated world, but imagine this: it could be most practical to have a supercharger for the engine at low revs, and a turbocharger at higher revs... □

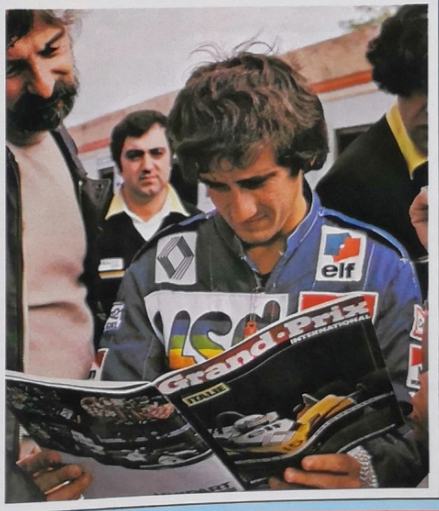
	Alfa Romeo	Renault	Ferrari	BMW	Hart
Bore mm	74	86	81	89.2	88
Stroke mm	43.5	42.8	48.4	60	61.5
No cyl.	8 in V 90	6 in V 90	6 in V 120	4 in line	4 in line
cc	1,496.7	1,491.7	1,496.4	1,499.8	1,496.2
Block material	Aluminium	Cast	Aluminium	Cast	Aluminium
Fuel system	8 carbs	Kugel inj	Lucas inj	Bosch inj	Lucas inj
Turbo	2 KKK	2 KKK	2 KKK	1 KKK	1 Garrett

PROST Scriptum

Lauda's comeback: no one spoke of anything else in Montreal. It was as though there was nothing of interest going on at the circuit. But I must admit that I got caught up in the game, as did most drivers. Dominique Bressot, a journalist with the radio station Europe 1, decided to interview Laffite and I on the subject and record our comments. It was a good idea, because Jacques and I belong to different generations. He'd raced against Lauda. Back in 1975, I was too busy memorising the corners at Circuit Paul Ricard before the Volant Elf final to be interested in Formula 1. But that year Lauda won his first world championship. Since then, we've found ourselves at the same circuits, but we haven't been racing in the same event.

People have made various comments about Lauda's return to Grand Prix racing. Personally, I'm for it. It would do Formula 1 a lot of good. I don't think it matters whether he earns £1.5 million or £2 million. That's his problem, not mine. But Lauda is a legendary figure, a superstar, and we need a superstar in Formula 1 to draw in the public. The sponsors need him too for the same reason. The two are dependent on one another. Currently we're losing all our superstars, all the world champions are retiring. Fittipaldi and Scheckter retired last year, and Andretti (perhaps) and Jones are pulling out this year. And they say that if Reutemann wins the world championship at Las Vegas, he'll quit too. So who's going to be the superstar to attract the public? A driver's image isn't built in a day, and in the space of two years, four world champions will have quit Formula 1. But when I talk about people like Jones, Scheckter or Andretti, I don't mean to put them in the same class as Lauda. He's on a different level. The public are conscious of that, and Marlboro is too.

Jacques didn't agree with me. Firstly, he finds the whole thing distasteful. He doesn't see how a twice world champion could make a comeback just for the money, like some old singer who keeps coming back for an encore. For Jacques, Formula 1 is a long-standing disease. You can't dip in and out of it. I do agree with him in some respects, but not totally. Of course Lauda isn't indifferent to the vast sums of money offered to him. Who would be in his position? But there's no proof that he's coming back just to put a smile on his bank manager's face. If that is the case, though, he's going to find it very boring.



Jacques went on to say that he didn't agree that Lauda would be beneficial to Formula 1. According to him, Lauda isn't going to be a success, and therefore he won't thrill the public but will be a disappointment. I'm not saying that Lauda will be immediately competitive, nor perhaps on the same form as he was in 1975, but who knows? Everything is possible with that man. Personally, I find the idea of racing against Lauda to be very attractive.

Not many people know this, but I could well have been Lauda's teammate in the McLaren team this year. Marlboro made him an offer at the end of last season, and at that time, Teddy Mayer was trying hard to keep me in the team. But in the end, he didn't join the team, and I left.

The end of our discussion was even more lively. Jacques told me off like a kid for talking about people I didn't know, but he was joking. Anyway, he doesn't believe in Lauda's return. He thinks that Lauda is too intelligent and too proud to come back and possibly jeopardise his public image. Jacques made me smile when he said that. It's true, I don't know Lauda, but on the other hand, I do know the Marlboro people. And when they have an idea in their heads... That was something I failed to learn and it was at my expense. Lauda will return to racing. I'm ready to take bets on it.

A. Prost

OK, AYJAY?

Alan Jones

Let me apologise to all the readers of Grand Prix International, who saw the news of my retirement in their papers, for not having mentioned it in the last column from Monza. To tell the truth, when the column was written a couple of days after the Italian GP, I still hadn't made up my mind. Nevertheless, you will have guessed from the interview that appeared in these pages after Holland that retirement was still very much on my mind. The idea of pulling out sort of crept up on me slowly. Only when I had finally made it did I know that it was what I really wanted to do, even though it's cost me a great deal of money.

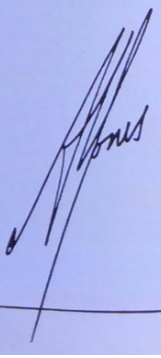
I don't propose to go all over again into the reasons why I'm not enjoying my racing as much as I used to. But I shall be very happy not to have to drive the crazy cars we're stuck with this year. With teams like Ferrari standing in the way of any kind of solution, I suspect that there's going to be a lot of fighting over the winter. And I have better things to do with my time than to get involved in that. If the rule makers want me to ride a bucking bronco, I would much prefer to be doing it at 10 mph on my farm in Victoria than in a 180 mph racing car on a circuit.

At the same time, I shall be extremely sorry to leave the dedicated people who have made my success possible. Frank Williams, Patrick Head and many of the other people in the team have grown up together with me, both as competitors and as human beings. I shall miss their friendship and company, even though I hope that they will let me come and join them in the pits at a few GPs, because I hope to stay in touch. Sorry, my French friends... I shall still be around from time to time.

At the end of qualifying in Montreal, I felt that I had a reasonable chance of keeping my world championship hopes alive. Goodyear produced some excellent qualifying tyres for us to try, though the heavy rain on race day meant that we had completely wasted two days of hard work setting up the car on a dry track.

Even when the race started, though, I felt I had a fair chance while the track was drying. I managed to find my way into the lead of a race which I had won in 1979 and 1980. But then it started to rain cats and dogs and suddenly I was being overtaken by my journalist colleague Alain Prost. By rights, the turbo Renault shouldn't be in the first ten on a circuit like Montreal, and here it was, going past me in the rain. If I hadn't already decided to retire, that in itself would have been good enough reason for going back home forever to Australia.

I felt really good in Canada, despite some pain from my famous broken finger. Despite it being my last chance of defending the world championship, I was relaxed and having fun. I didn't really feel sorry when I retired from the race with my car sliding all over the road, even though it was the end of my chances. Now it's Carlos's turn to fight it out with Nelson and Jacques at Las Vegas. I shall be there, trying to win the last Formula 1 Grand Prix of my career. I think I have a good chance too. With all the pressure off me at last, I shall be able to race for enjoyment. It would be nice to leave F1 with a victory. I can't remember any world champion, not even Fangio, who was able to go out on a high note like that. So just keep an eye out for number one Williams when you tune in your TVs for the final round of the 1981 world championship from Las Vegas in three weeks time.



Cockpits

TALBOT GITANES

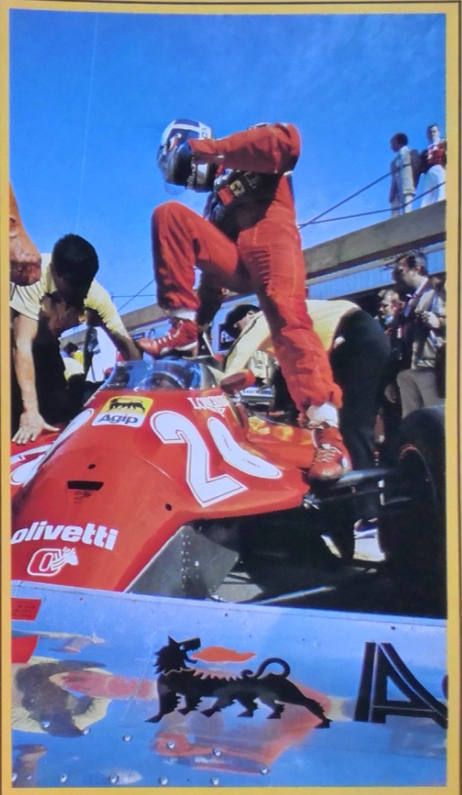
Ligier-Matra JS 17/05:
Jacques Laffite (F)
Ligier-Matra JS 17/04:
Patrick Tambay (F)
Ligier-Matra JS 17/04:
spare

The Ligiers had been slightly modified with a bigger rear wing and more downforce, plus bigger brakes for the tight Montreal circuit. The hydraulic suspension system had also been slightly revised. Initially, the spare had a different track, but that was altered so that it was similar to the other two Ligiers. Laffite started from tenth on the grid, but climbed through the field to claim the chequered flag and his second win this year. Tambay crashed early in the race.

MALBORO MCLAREN

Marlboro-Ford MP 4/4:
John Watson (GB)
Marlboro-Ford MP 4/1:
Andrea de Cesaris (I)
Marlboro-Ford MP 4/2:
spare

John Watson had the new MP4 specifically built up for Lauda's much-publicised test shortly after Monza. Both his car and the spare had wider front track, but Watson prefered chassis number four. De Cesaris had the original MP4 chassis with a narrow track, his main problem being that the car wasn't using its tyres to the best advantage. When using qualifiers, he had to stop in the pits, but all the same, he set 13th fastest time on the track where he made his Grand Prix debut. Watson qualified ninth quickest, and came home in second place behing Laffite. De Cesaris spun eleven laps from home and stalled the engine.



FERRARI SEFAC

Ferrari 126 C/050B:
Gilles Villeneuve (CDN)
Ferrari 126 C/049B:
Didier Pironi (F)
Ferrari 126 C/052:
spare

Villeneuve had the second of the latest, squarer moncoques, while the spare still comprised the modified version. The cars were fitted with bigger brakes and ducts for this demanding Canadian circuit. Villeneuve qualified eleventh and Pironi was twelfth. Despite a bent front wing, Villeneuve came home in third place, but Pironi retired with electrical problems.

PARMALAT BRABHAM

Brabham-Ford BT 49C/15:
Nelson Piquet (BR)
Brabham-Ford BT 49 C/12:
Hector Rebaque (MEX)
Brabham-Ford BT 49 C/14:
spare

The team had two new chassis at Montreal, one for Piquet and one to be used as his spare. His own car had bigger brakes and a rear wing with a big flip-up. The spare was fitted with carbon fibre disc brakes and was frequently used by Piquet during practice. However, Goodyear's wet tyres did not perform well and Piquet finished in fifth place having start from pole position. Rebqaue qualified in a promising sixth place but crashed on lap 35.

Cockpits

MARLBORO ALFA ROMEO

Alfa Romeo 179 D/02:
Mario Andretti (USA)
Alfa Romeo 179 C/02:
Bruno Giacomelli (I)
Alfa Romeo 179 C/04:
spare

All three Alfas were this year's models with new side pods and a new rear wing similar to Ligier's. Gerard Ducarouge's experience being in evidence again. Giacomelli tried this set-up on Friday while Andretti used the spare, but in the end, both drivers reverted to the Monza set-up with the normal rear wings and side pods. Giacomelli had a broken fuel pump on Friday and his car also broke a side pod. However, he qualified 15th, one place ahead of Andretti. The Italian finished in a good fourth place, while the American was just out of the points in seventh place.

THEODORE RACING

Theodore-Ford TY/01:
Marc Surer (CH)

There was just one Theodore at Surer's disposal, but it had an adjustable wheelbase. Firstly the bell housing had been changed to give a different wheelbase, but by changing the front wisbone, the wheelbase could be further altered. Surer qualified 19th and finished ninth.

JOHN PLAYER TEAM LOTUS

Lotus-Ford 87/3:
Elio de Angelis (I)
Lotus-Ford 87/5:
Nigel Mansell (GB)
Lotus-Ford 87/2:
spare

Mansell had a new tub, number five, which was at Monza but not finished. The spare car was fitted with a narrow front track on Friday, but it was disappointing. De Angelis complained that the rear end of his Lotus was handling worse than the front once the track afforded better grip, which he blamed on poor weight distribution. He had a bad accident on Saturday when the right rear suspension broke at maximum speed. The Italian was lucky to be able to drive back to the pits, admittedly on three wheels, the fourth not being in contact with the road at all. All the same, the Lotuses were impressive in practice, Mansell qualifying fifth and de Angelis starting from seventh on the grid. The Englishman spun on slicks and shortly after collected Prost, while de Angelis came home in sixth place. The team is preparing Lotus 88/87 chassis which will have different weight distribution.

MARCH GRAND PRIX

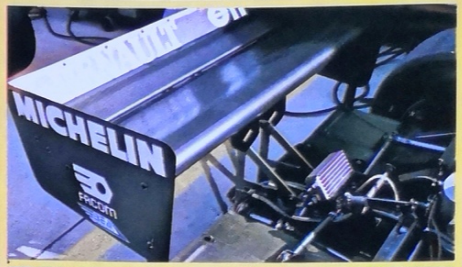
March-Ford 811/06:
Derek Daly (IRL)
March-Ford 811/04:
spare

New rear suspension expected for Montreal didn't appear as it needs more testing. Daly tested both cars with and without a front wing, and ultimately chose the wide front wing seen earlier in the season. He qualified a lowly 20th on the grid, but once again drove a storming race to finish eight after tyre trouble when the track began to dry.

TAG WILLIAMS

Williams-Ford FW 07C/16:
Alan Jones (AUS)
Williams-Ford FW 07C/17:
Carlos Reutemann (RA)
Williams-Ford FW 07C/15:
Jones's spare
Williams-Ford FW 07C/12:
Reutemann's spare

The team had taken four FW07s to Canada, including chassis number twelve which had been Reutemann's regular car up to Silverstone. The Argentine also had a new engine in the back of his Williams. Both spares were fitted with a brake cooling system using water from a tank behind the radiator in the side pods. The other two chassis had bigger brakes and ducts. There was also a bigger rear wing, bigger flip-up and new wing support. Both drivers had their cars in different set-ups. Jones used 13 inch rims on his spare which he found to be good, which is why Reutemann took two cars to the line before the start: his own on intermediates and Jones's spare on wets. The latter handled better but had a slight problem. In the end, Reutemann raced his own machine fitted with Jones's wets on the back but his own intermediates on the front. Despite starting from the front row, he finished tenth, while Jones couldn't get to grips with his Goodyears and retired after less than 25 laps.



RENAULT ELF

Renault RE 33:
Rene Arnoux (F)
Renault RE 34:
Alain Prost (F)
Renault RE 32:
spare

The Renault team had been testing for the tight two circuits at the end of the season for some time, so it wasn't surprising to see a number of changes. Although there was no new electronic ignition, the engines were fitted with new injectors, new intercoolers, honeycomb structure side pods, 13 inch front wheels, different brake ducts and new carbon fibre front and rear wings. Most of these modifications had been made to Prost's car which weighed in at 595 kilos while Arnoux s was three kilos heavier. Prost's engine was fed by smaller turbos on the Friday but one of these broke and they weren't used again. The Italian Grand Prix winner set fourth fastest time, while his teammate was eighth on the grid. Neither driver finished, both being involved in the slipping and sliding of others on the wet track.

TYRRELL

Tyrrell-Ford 011/2:
Eddie Cheever (USA)
Tyrrell-Ford 011/1:
Michele Alboreto (I)

Both Tyrrells were fitted with the new rear suspension used by Alboreto at Monza which comprises a different pick-up point for the top wishbone and more camber change. There were also changes to the front suspension including a new anti-roll bar and more anti-dive. Alboreto tested Goodyears on Saturday morning but only did six laps which were admittedly quick. Then he crashed when he lost the brakes and his mechanics had to repair the car for the afternoon session. While Cheever was 14th on the grid, Alboreto was 22nd. The Italian finished last, while Cheever retired six laps from home.

ATS WHEELS
ATS-Ford HGS1/2:
Slim Borgudd (S)
ATS-Ford HGS 1/1:
spare

Slim Borgudd had two ATS cars at his disposal, both fitted with front nose fins rather than a wide wing. The Swede qualified 21st but was another to fall foul of the slippery conditions.

DENIM OSELLA
Osella-Ford FA1C/01:
Jean-Pierre Jarier (F)
Osella-Ford FA1B/04:
Beppe Gabbiani (I)

Osella's new C model was fitted with two small nose fins instead of a big front wing. It also had new side pods with a different profile which pushed the aerodynamic downforce pressure point further back. Jarier stopped on the circuit on Saturday when the fuel pump developed a pick-up problem but he qualified a lowly 23rd. Gabbiani had a lot of problems, including a broken fuel pump on Friday and a blown engine on Saturday morning. Only two mechanics were detailed to change it and Gabbiani had only 15 minutes in which to qualify on Saturday afternoon. Not surprisingly, this wasn't enough. Jarier retired before half distance.

RAGNO BETA ARROWS
Arrows-Ford A3/5:
Riccardo Patrese (I)
Arrows-Ford A3/3:
Jacques Villeneuve (CDN)
Arrows-Ford A3/2:
spare

After the team's skirt problems at Monza, the mechanics had changed the cars back to the older system. Patrese's spare was fitted with new rear suspension plus a new engine and gearbox, and unlike Stohr, Jacques Villeneuve was allowed to use this machine. However, he didn't qualify. Patrese prefered two nose fins rather than a wide front wing, but didn't like the handling even though there was nothing wrong with his car. He blamed it on the tyres. He qualified in a lowly 18th place but firstly pitted with a gearbox problem and then went off the track on the sixth lap.

FITTIPALDI
Fittipaldi-Ford F8C/03:
Keke Rosberg (SF)
Fittipaldi-Ford F8C/04:
Chico Serra (BR)

There was no spare for the drivers at Montreal but a third car would have probably been as uncompetitive as the two that were taken to Canada. Rosberg admitted that he was happy providing one didn't talk about his current car.

ENSIGN
Ensign-Ford N 180B/15:
Eliseo Salazar (RCH)

Salazar had just one Ensign for his North American campaign and he squeezed onto the last spot on the grid as he had at Monza. However, he lasted only eight laps in the slippery conditions.

CANDY TOLEMAN
Toleman-Hart TG 181/5:
Brian Henton (GB)
Toleman-Hart TG 181/4:
Derek Warwick (GB)
Toleman-Hart TG 181/2:
spare

There was only one monobloc, engine at Montreal, and that was in the back of Henton's car. The other monobloc was back at Brian Hart's factory in England. Warwick destroyed his Toleman's nose cone and front radiator when he went off the track on Friday. But both drivers were back in the role of non-qualifiers in Canada.

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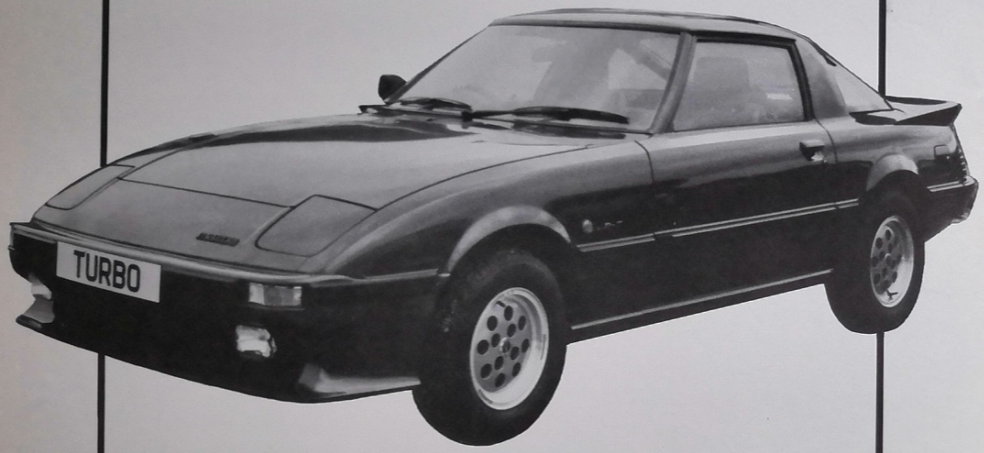

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